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# USSR Report

## TRANSPORTATION

No. 99



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## CONTENTS

# MOSCOW MAGAZINE RELATES FOOD PROGRAM TO MOTOR TRANSPORT

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 7, Jul 82 pp 1-3

[Editorial: "The Transportation Component of the Food Program"]

[Text] The USSR Food Program covering the period up to the year 1990, which was adopted at the May Plenum of the CPSU Central Committee, is a most important component of the party's economic strategy for the next decade. The decisions of the plenum have been received with tremendous enthusiasm by our entire people.

The Food Program is an extension of the line of the party toward further development of agriculture. Its distinguishing feature is its targeted and comprehensive approach, the linkage and unification of efforts both of agriculture itself and also of the sectors of industry, transportation and trade which serve it, the subordination of all their activity to the overall final goal--production of high-quality foodstuffs and their delivery to the consumer.

The Food Program outlines high specific targets for the production of principal types of farm products and indicates ways of achieving them. It especially emphasizes that the key problem in agriculture is still a faster growth rate and stable production of grain. Plans call for increasing the grain harvest to 238-243 million tons in the 11th Five-Year Plan and to 250-255 million tons in the 12th.

The program presents crucial tasks to livestock raisers. The average annual production of meat (carcass weight) is to reach 17-17.4 million tons in the 11th Five-Year Plan and 20-20.5 million tons in the 12th, milk production 97-99 million tons and 104-106 million tons, respectively, and egg production 72 billion and 78-79 billion eggs, respectively.

The many years of experience of kolkhozes and sovkhozes which have achieved high results in the development of livestock raising convincingly shows that the basis of their success is constant concern about supplying a variety of quality animal feeds to livestock farms. That is why a special place has been given in the Food Program to creating a solid source of animal feed for livestock raising. Plans call for bringing the country's production of animal feed up to 500 million tons of fodder units in 1985 and 540-550 million tons in 1990, the storing of hay up to 110-112 million tons, and the production of root

crops for animal feed to 60-63 million tons. Measures have been envisaged to further intensify the growing of animal feeds in the field and in meadows and pastures and for increasing the productivity of all land on which animal feed is grown.

The program also calls for improving the supply of fruit and vegetables and potatoes to the public by virtue of a further growth of production and improvement of their quality, as well as a sharp reduction of product losses en route from the field to the consumer. Highway transportation is being given a large role in the preservation of agricultural products in this stage.

An exceedingly important condition for successful fulfillment of the Food Program is acceleration of scientific-technical progress, highly effective utilization of production potential and a strengthening of the physical plant and equipment of agriculture and of all branches of the agroindustrial complex on the basis of further development of the mechanization and chemicalization of production and extensive reclamation.

The program emphasizes that it is a priority task of machinebuilding ministries and other ministries and departments in the agroindustrial complex to basically complete in the period up to the year 1990 the full mechanization of cropping and animal husbandry and the retooling of the food branches of industry on a new technical basis. Over the decade agriculture will receive deliveries of 3.74-3.78 million tractors, 1.17 million grain-harvesting combines, and hundreds of thousands of excavators, bulldozers, scrapers and self-propelled graders.

The state is committing very large resources to develop the branches of the agroindustrial complex. It is sufficient to say that in the 11th Five-Year Plan capital investments in those branches will amount to 233 billion rubles, and within that 189.6 billion rubles will be invested in agriculture.

It is an exceedingly important task to decisively increase the efficiency of agricultural production and of the entire agroindustrial complex. The center of gravity, as pointed out at the 26th CPSU Congress, is now shifting to the return on capital investments, the rise of agriculture's productivity, to the deepening and refinement of its connections with all the different components of the agroindustrial complex. Over the 10-year period labor productivity is to be raised approximately 1.5-fold on kolkhozes and sovkhozes, and the yield per hectare of land is to increase by at least one-third by introducing intensive farming methods, by making better use of land, production capacities, and labor, physical and financial resources, and by striving persistently for economy and thrift.

Along with the Food Program the May Plenum of the CPSU Central Committee approved a number of decrees of the CPSU Central Committee and USSR Council of Ministers which elaborated a system of measures aimed at improving management of the agroindustrial complex and improvement of the economic mechanism and of its functioning and development. They also envisaged management and planning methods, incentive procedures, ways of conducting economic activity which should create conditions for highly productive work and should be conducive to successful development of agriculture.

The agroindustrial complex is being distinguished for the first time in our practice as an independent object of planning and management. The opportunity is thereby created for better and more effective combination of regional, sectoral and target-program planning based on the end result, which is continuous supply of food to the country. The unified system of management of agriculture and of its related sectors, both at the center and at the local level, is subordinated to this goal. Agroindustrial associations will be created in rayons, krays, oblasts and ASSR's, and agroindustrial commissions will be set up in the union republics and at the center. Emphasis is being placed here on the need to strengthen kolkhozes and sovkhozes in every way and to increase their independence as organizational and business entities. Important changes are being made in relations among kolkhozes, sovkhozes and the organizations that serve them.

The decrees also provided for measures to set up authentic cost accounting (khozraschet). To be specific, as of 1 January 1983 purchase prices are being raised for a number of products of cropping and livestock raising, price supplements are being introduced on the output achieved on farms operating at a loss or with a low rate of profitability, remuneration is being improved on kolkhozes and sovkhozes, provision is made for broad introduction of the work-team and collective contract, for the job contract and bonus system and for remuneration of labor in kind, and the salaries of managers, specialists and employees of sovkhozes are being raised (by an average of 30 percent). Confidence in managers is being combined with enhancement of their personal accountability for the work assigned them. An additional amount exceeding 30 billion rubles will be spent in 1983 to carry out measures to strengthen the economic condition of kolkhozes and sovkhozes, to stabilize the work force, and for production incentives. These funds should yield a return in the form of a sizable increase in output.

Measures to improve social welfare and living conditions are an organic part of the Food Program. In the eighties approximately 160 billion rubles will be committed to those purposes.

The Food Program has paid the necessary attention to personal subsidiary farms and garden and orchard cooperatives.

The work force of highway transportation assumes full responsibility in its awareness of the size of the problems which it confronts in connection with the set of measures for practical realization of the Food Program which has been outlined by the party.

The fourth section, entitled "Supporting the Branches of the Agroindustrial Complex With Transportation, Containers and Packaging Materials," is specifically devoted to transportation services to support the agroindustrial complex.

A growth of agricultural production also signifies a growth of the volume of freight which has to be handled. Full mechanization of operations requires the delivery of more equipment and fuel to rural areas. Development of plant and equipment in rural areas and improvement of the social welfare and living conditions of agricultural workers are impossible without well-organized and prompt delivery of building materials, equipment and machines.

Plans call for allocating to agriculture 3-3.06 million trucks and 3.2-3.3 million tractor-drawn trailers to agriculture to perform this task, and kolkhozes, sovkhozes and enterprises of the food branches of industry will receive 110,000-116,000 milk trucks and 50,000-53,000 livestock trailers. A total of 76,000-78,000 refrigerated trucks will be allocated to the branches of the agroindustrial complex and to common highway carriers.

The principal task of the labor force of highway transportation is to organize exemplary transport service to rural areas. In every transport administration measures must be performed to expand the network of motor transport enterprises serving agriculture, to strengthen their productive plant, and to replenish the fleet of those enterprises with the necessary vehicles.

In recent years motor transport personnel have gained considerable experience in forwarding service to railroad stations and in centralized delivery of freight to consumers. In RSFSR alone common highway carriers have organized centralized forwarding service to 440 rail stations. But this should be regarded as the beginning of a large and important effort to provide forwarding service. As transport service to agriculture is improved, cooperation needs to be developed more vigorously with railroad personnel and rivermen, and a joint effort should be made with them to solve the problems of mechanizing freight-handling, building roads and access roads to railroad stations and riverports, organizing motor transport combines, etc.

It is important to take universal advantage of the constructive experience of the Pavlovo Motor Transport Combine in comprehensive forwarding service to enterprises and organizations.

All of this work must be subordinated to the main goal, which is to deliver the freight promptly, without losses and at the lowest costs for kolkhozes, sovkhozes and enterprises of agroindustrial complexes so as to free as many agricultural workers as possible of concerns about transportation.

A progressive method for carrying farm products has been worked out at motor transport enterprises and has been in practice for many years; it uses computer equipment and radio-telephone dispatcher communications. This has made it possible to make more effective use of motor transport in the most strenuous period of agricultural operations and also to reduce delivery time for products to procurement points and elevators.

The unified centralized system for management of motor transport enlisted for the harvest has given a good account of itself. This system creates the prerequisites for applying progressive forms and methods of shipment and for increasing the efficiency of utilization of transportation equipment. Now there is a need for more vigorous and universal use of these progressive methods and procedures.

The carrying of fresh vegetables and fruit, including long hauls, from the southern regions to the country's industrial centers by truck is the most efficient, since it makes it possible to guarantee the freight's preservation and its prompt delivery. In recent years this traffic has been developing at a fast pace.

In 1981 motor transport enterprises of the RSFSR Ministry of Motor Transport alone delivered more than 100,000 tons of vegetables and fruit from the regions of the Northern Caucasus to the country's industrial centers. But now particular attention must be paid to this traffic.

The deliveries of specialized trucks and refrigerated trucks envisaged by the Food Program, the development of container shipments, extensive use of diverse containers, and mechanization of laborious freight-handling operations are creating favorable conditions for more efficient utilization of motor transport.

One of the important measures of the Food Program is to build roads in rural areas. It calls for organizing reliable transportation connections between kolkhozes and sovkhozes and rayon centers; over the 10-year period approximately 130,000 km of public highways and 150,000 km of farm roads are to be built in rural localities.

One of the most important tasks which truckers will confront as a result of this huge volume of road construction will be a sharp increase in the shipment of roadbuilding materials.

The method of the work-team contract, first introduced in bringing in the harvest by the Rostov truckers in 1975, which has given a good account of itself, needs to be adopted everywhere in organizing trucking operations for rural areas. Contracts concluded by collectives of drivers and the workers of agriculture and procurement organizations on fulfillment of specific jobs by specified dates makes it possible to guarantee high productivity of labor in every section.

Figures like these show the efficiency of adopting the work-team contract. Every year as many as 5,000 work teams, comprising more than 50,000 trucks and 60,000 drivers, work according to the method of the work-team contract during the harvest season in the oblasts, krays and ASSR's of RSFSR. The daily output per truck working as a part of a team is 1.5-1.8-fold greater than the average output of trucks participating in the harvest. Common highway carriers now have an entire complex of effective methods of organizing the traffic of agricultural loads which have been proven in practice. In the context of the nationwide effort to boost agriculture, extensive adoption of these methods will make it possible to solve the problems of transport service more quickly and effectively.

Speaking at the May Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev remarked: "The Food Program is advancing tasks which differ in their completion dates--both long-range, medium-term and urgent and immediate ones. It seems to me that it is the latter that should now be placed at the center of our concern."

Timely preparation of highway transportation and efficient handling of this year's harvest represent that kind of urgent and immediate task for the personnel of the trucking industry. This means that that important experience which truckers have gained over many years in preparing for and handling the harvest should be universally and fully utilized in preparing transportation equipment

and especially in organizing the management of motor transport in the present crucial period for the 1982 harvest.

Experience in past years should be used in organizing socialist competition still more widely, in strengthening the cooperation of grain growers, procurement people, and branches related to the trucking industry and in perfecting the operation of the transport conveyor.

The workers in motor transport, along with all the Soviet people, approve the decisions of the May Plenum of the CPSU Central Committee. They are fully determined to make their contribution to fulfillment of the USSR Food Program.



7045
CSO: 1829/292

# MEASURES FOR IMPROVING MOTOR VEHICLE REPAIR

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 5, May 82 pp 29-30

[Article by deputy department chief of USSR Gosplan transport department, distinguished RSFSR economist, candidate of economic sciences V. Karpunenkov: "Major Repair of Motor Vehicles on an Industrial Basis"]

[Text] In recent years, the country's motor vehicle fleet has increased sharply. The automotive industry systematically performs labor directed at increasing the reliability of motor transport equipment and decreasing the laboriousness of preventive maintenance and repair actions. This has allowed us during the 10th Five-Year Plan already to raise by a factor of 1.2-1.5 the service life of vehicles and engines before major repair and to decrease labor expenditures by 15-20 percent for technical service and routine repairs. Nevertheless, the motor vehicle, just as any other complex mechanism, requires timely and high quality repair to maintain it in good working condition.

Inter-branch motor vehicle transport for general use in our country was developed practically in the post-war years. Prior to this, new vehicles were sent to the various branches of the national economy, and therefore the productive capacity for major repair of vehicles and units was developed in the branch ministries and departments and in the transport system for general use.

This led to the development in the country of more than 900 vehicle repair plants with varying capacity. Annually they perform up to 500,000 major repairs of vehicles and approximately 2 million of engines. Moreover, many of the small repair shops and the overwhelming majority of the operating motor transport enterprises are engaged in the major repair of motor transport equipment.

This all leads to the inefficient consumption of spare parts and material and labor expenditures. It also impedes the means of specialization and the implementation of a single technical policy in the area of major repair of vehicles and does not provide a suitable quality of repair.

For a long time, the practice of preferential repair of fully equipped vehicles was considered proper. Moreover, upon arrival for major repair,

vehicles and their units underwent a complete dismantling followed by a defect survey of components which then were restored or replaced with new ones. As a result of such technology for major repair of vehicles, the required quality was not achieved; as a rule, their service life following repair is 45-50 percent of the service life of new ones, but in many instances does not exceed 30-40 percent. Moreover, the cost of major repair of vehicles nearly equals the cost of producing new vehicles.

The disorderliness of factory capital repair of vehicles in the country made it necessary to perform vehicle and unit repair at the motor transport enterprises which led to the creation within the operating enterprises of shops necessary for the repair of units and a vehicle as a whole (mechanical, body, motor, unit and others). Within its structure, practically every large operating enterprise has shops for repairing units and vehicles.

Nevertheless, even in these conditions the proper effect is not achieved from major repair of vehicles.

The separation of enterprises for major repair of vehicles and units among various ministries and departments caused an improper system for supplying them with spare parts.

Each vehicle repair and operating enterprise attempts to establish warehouses with the availability of a whole list of spare parts which, under the conditions of different-branded stock of the vehicle fleet it is impossible to do practically at any level of their production.

In one instance, the lack of proper information concerning the availability in requirements in spare parts for each enterprise leads to excesses of certain stock, while in another instance to shortages of the very same stock, at another enterprise.

From that which is cited, it follows that maintaining motor transport equipment in proper and technically good working condition is a complex problem, and its solution depends on the proper organization of major repair of vehicles and an efficiently structured system for supplying repair and motor transport enterprises with spare parts. Just what is necessary to solve this problem?

First of all, it is essential to concentrate the attention of the automotive industry itself on its solution.

In all the most developed capitalist countries, maintenance of transport equipment in good working condition preferably by means of replacing units is accomplished by the automotive industry producing the vehicle.

Also indicated in this regard is the experience accumulated in our country in the automotive centers of the Volga automotive plant.

A similar system of organizing repair was envisaged for trucks of the Kama automotive plant; this envisaged the creation of capacities for performing

major repair of assemblies, units and engines at the plants in Naberezhnyye Chelny, Tashkent, Novyy Oskol, and also creating automotive centers in all the union republics.

Envisioned are the transfer of the Kustanay vehicle repair plant of the KaSSR Ministry of Motor Transport to the Ministry of the Automotive Industry and reorganization of the Simferopol repair plant which was transferred to the ZIL industrial association.

The supply of spare parts for vehicles manufactured by the Kama, Volga and Belorussian automotive plants, as well as the "Moskvich" and "Zaporozhets" vehicles, is accomplished directly through the appropriate industrial associations of the Ministry of the Automotive Industry. Nevertheless, the planned measures do not ensure entirely an improvement in the status of major repair of motor transport equipment in the country.

In our opinion, it is essential to continue work on the creation of a network of enterprises for the repair of units. Moreover, a network of vehicle repair enterprises must be specialized by individual basic vehicle (KamAZ, GAZ, ZIL, MAZ and others), subordinate to the Ministry of the Automotive Industry, and arranged in the economic regions taking into account an efficient distance for delivering units to and from repair (200-300 kilometers).

A leading enterprise directly connected with the basic plant-manufacturer of new vehicles must be situated at the head of each line (make).

With such a system for organizing vehicle repair in the country, there is the possibility of using to the maximum degree the operating capacities found in management of the union republics, ministries and departments; and to achieve the desired results for short periods of time with the allotment of small capital investments for the reorganization and modernization of operating enterprises.

With this it is essential to modify the operating technology of vehicle repair: to change to the repair of units only, not to perform generalized repair of individual units, and not to dismantle all units if it is not required by their technical condition.

Putting major repair of vehicles in order will create the prerequisites for improving the system in supplying spare parts.

Further improvement of the organization of vehicle repair can be achieved by transferring the vehicle repair plants from the ministries and departments to the Ministry of the Automotive Industry and changing the system of supplying spare parts by the creation of zonal basic warehouses in the Ministry of the Automotive Industry system.

For the long range it is essential to create such a situation that would make possible the prohibition of major repair of vehicles and units in operating vehicle industries, and to change completely to the repair of units only and only at industrial enterprises.

Under these circumstances, only ordinary care, technical service and repair with replacement of assemblies and units will remain in the vehicle industries. A savings will be achieved as a result of this: in capital investments being expended at present for the creation of an entire complex of shops (mechanical, motor, unit, etc.) attached to each vehicle industry; in machine tool equipment, metal, electric energy and other materials.

As a result of this, it will not be required to have one's own warehouse of spare parts, and by entire list besides, in each vehicle industry.

The implementation of measures for improving the repair and spare parts supply system of motor transport enterprises makes it possible to provide a high level of technical condition for the country's motor vehicle fleet with less material and labor expenses.



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## OPERATION OF TRUCK PARTS CENTER DESCRIBED

Moscow AVTOMOBIL'NYY TRANSPORT in Russian No 7, Jul 82 pp 26-27

[Article by V. Skvortsov, engineer of the Chelyabinsk Automotive Center of KamAZ]

[Text] Obtaining spare parts and assemblies for motor vehicles has always been an important problem for ATP [motor transport enterprises].

The Kama Association for Production of Large Trucks [KamAZ] was the first of the enterprises manufacturing trucks to be ordered to set up its own plant system for supplying spare parts to ATP.

The automotive centers now in operation monitor the operation of trucks, supply spare parts for them, take in assemblies and units for repair, do some of the repairs on them, and extend aid to the enterprises in training and improving the qualifications of drivers, repair personnel and engineering and technical personnel.

As the experience of operating the automotive centers has demonstrated, direct interaction between the manufacturing plant and motor transport enterprises has great importance to improving the technical serviceability of KamAZ trucks (the technical serviceability of KamAZ trucks is 10-15 percent higher than for trucks of other makes).

As the fleet of KamAZ trucks grows and as KamAZ engines are used in other vehicles (ZIL, Ural, LAZ, LiAZ) the automotive centers will have to not only supply spare parts to motor transport personnel, but also to provide warranty-period maintenance of vehicles and units, technical servicing to vehicles passing through, and also to increase the volume of work in rebuilding parts, assemblies, and brake and fuel equipment. The network of KamAZ automotive centers will be expanding in order to maintain high technical serviceability of the fleet in the 11th Five-Year Plan.

As of 1 January 1982 the Chelyabinsk Automotive Center had in its records 1,133 KamAZ-5320 trucks, 987 KamAZ-5410, and 989 KamAZ-5511. We are in addition monitoring the condition of 52 ZIL-133GYa vehicles.

Table 1

| Model Year | Number of Vehicles | Average "Mileage," thousands of km |
|---|---|---|
| 1976 | 178 | 366 |
| 1977 | 512 | 305 |
| 1978 | 432 | 244 |
| 1979 | 551 | 183 |
| 1980 | 786 | 122 |
| 1981 | 650 | 61 |

Table 2

| Ministry | No of Vehicles | Total No of Enterprises | No of Enterprises Grouped by No of Vehicles | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2-5 | 10-20 | 20-50 | 50-100 | Over 100 |
| Motor transport | 1,618 | 22 | -- | -- | 6 | 7 | 4 | 5 |
| Transport construction | 25 | 5 | -- | 3 | 2 | -- | -- | -- |
| Agriculture | 197 | 24 | 9 | 1 | 3 | -- | -- | -- |
| Construction of heavy industry enterprises | 468 | 16 | 1 | 2 | 4 | 8 | 1 | -- |
| Ferrous metallurgy | 304 | 34 | 10 | 11 | 11 | 1 | 1 | -- |
| Coal industry | 72 | 9 | 2 | 6 | -- | -- | 1 | -- |
| Power and electrification | 83 | 7 | 2 | 1 | 4 | -- | -- | -- |
| Other ministries and departments | 342 | 91 | 41 | 39 | 8 | 2 | 1 | -- |

Table 3

| Department Using Engines | Average "Mileage" of KamAZ Engines, thousands of km | | | | |
|---|---|---|---|---|---|
| | 1977 | 1978 | 1979 | 1980 | 1981 |
| South Ural TTU [Trucking Administration]: | | | | | |
| New | 110 | 120.1 | 119.2 | 133.6 | 162.1 |
| Repaired | -- | 49.1 | 50.0 | 51.2 | 54.5 |
| Other departments: | | | | | |
| New | -- | 115.3 | 124.1 | 142.1 | 155.3 |
| Repaired | -- | 67.2 | 52.3 | 56.5 | 72.1 |

The growth of the fleet of KamAZ trucks operated in Chelyabinsk Oblast, and the average "mileage" are given in Table 1. These trucks belong to 39 ministries and departments. Their distribution among various enterprises is shown in Table 2. It is evident from the table that at 142 enterprises the number of KamAZ trucks does not exceed 5. As a rule they do not have specialists qualified in the operation and repair of these trucks, and at some enterprises they

do not even have the necessary space set aside for this purpose, not to mention the equipment, the tools and the fuels and lubricants. All of this results in premature failure of assemblies and units, breakdowns, lengthy idle time and additional repair costs.

The idleness of trucks manufactured in the 1976-1978 period with a "mileage" of 400,000 km or more exceeds by 30-35 percent the idle time of trucks manufactured later, and the consumption of spare parts is 40-45 percent higher.

Table 3 shows the average "mileage" of new and repaired engines of trucks belonging to the South Ural TTU and other departments. The principal reasons for their dropping out of service is that motor transport enterprises use oils and special liquids not recommended by the manufacturing plant, excessive runs between scheduled servicings, incomplete servicing, poor servicing of the air intake, and the overloading the trucks (especially in open-pit mining).

As of 1 January 1982 593 trucks under warranty were registered with the Chelyabinsk Automotive Center. They are distributed as follows: 15 KamAZ-5320, 180 KamAZ-5410, 381 KamAZ-5511, 9 Ural-4320 and 8 ZIL-133GYa. Last year 25 claims were filed against us by motor transport people concerning the quality of the trucks. In 15 of these cases the reason for the defect was improper operation. The automotive center gave assistance to operators in the form of technical consultations on 456 occasions. Vehicles passing through were given assistance in the form of repair work costing 72,000 rubles.

In order to improve the serviceability of KamAZ trucks a stock of units and assemblies needs to be built up in automotive centers and at ATP in the approved list and quantity. Within transport administrations there is a need to set up groups for recording the idle time of trucks and for coordinating the supply to them of very scarce parts and assemblies. There is a need to review standard rates of consumption of spare parts in the case of certain parts which are in great demand and whose reliability has turned out to be lower than rated and to organize at auto repair plants centralized rebuilding of certain assemblies and parts which are not on the list for rebuilding at the plants of Minavtoprom [Ministry of Automotive Industry].

Ministries and departments need to take steps to concentrate KamAZ trucks at those ATP which have the facilities to operate and repair them properly and to strictly observe the requirements of the manual on operation of the trucks.

It would also be advisable for enterprises to build up their own limited inventory of spare parts depending on the service life of the truck and its "mileage." If a regulation is drafted on rewarding drivers and repair personnel for saving spare parts, they can be motivated to rebuild parts and assemblies and also to be thrifty in consuming them.



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## BAM'S PROBLEMS DISCUSSED

Moscow GUDOK in Russian 18 Jul 82 p 2

[Article by GUDOK crew I. Korol'kov, R. Minasov and B. Sverdlov from Tynda: "Hopes and Anxieties of the Thirty-Second. GUDOK at the BAM [Baykal-Amur Mainline] Meridians"]

[Text] The BAM is no longer just a construction project, it is an operating railroad. Three of the BAM's divisions, not yet linked directly by rails, are beginning to give the state a return on the funds expended for construction.

It is not an easy matter to build a main line and all the required facilities in untravelled taiga. It is not easy to build dozens of residential settlements for railroad workers in difficult climate conditions, in almost complete perma-frost. All this required creativity, enthusiasm and total commitment from the construction workers.

Now is the time for the operational workers to show what they are capable of. Right away, the railroad workers set major tasks for themselves. They are working under the slogans "The BAM Must Be an Exemplary Railroad" and "Let's Guarantee Safety on the Main Line of the Century."

The young rail workers, whose average age is 26, are giving the green light to trains with critical raw materials extracted in the northern part of Amur Oblast and Khabarovsk Kray, and in the southern part of Yakutia. Also, the workers are expediting empty through-trains. These two circumstances alone provide evidence that from the first days of the creation of the 32nd railroad, a national approach is being taken towards use of rolling stock. The norm for car turn-around has been considerably reduced in the Severobaykal'sk Division. During the past year and a half, about 30,000 cars have been saved in the Tynda division for additional loading. In the Urgal division almost all of the coal mined in excess of the plan

is being loaded in rolling stock which has been saved. Thus, youth is not always inexperienced.

Yet, life is presenting very difficult problems for the large and very young railroad. Our discussion with L. Lotarev, chief of the Baykal-Amur Main Line, is about these problems.

[Question] last year the BAM railroad workers loaded 9 million tons of goods and transported 14 million tons. In 1982, the technical plan provides for increasing these totals by 40 percent. The increase will continue in succeeding years. Do these assigned rates correspond to the construction rates of the main line?

[Answer] I have just received the report for yesterday--276 gondola cars were loaded with coal on the railroad. A year ago, we loaded slightly more than 100 cars per day from 2 mines. Yet, at the start of BAM construction, the designers and planners asserted repeatedly that, even after the main tracks were activated, the maximum volume of transport would be 3 million tons per year. They were quite wrong.

The volume of transport will increase. Today's small BAM has almost exceeded its traffic capacity.

According to the technical plan, all the double-track sections were to be completed; but construction of these sections has been simply abandoned. I cannot understand why the activation of the automatic block signal system and centralized train control system was planned for the end of the 5-year period, since the railroad, even now, must operate at full strength. Of course, it is wrong to reproach the designers and planners for all these problems. They might not have foreseen some problems such as the fact that the main line will extend further north in the near future. But that does not make things any easier for us! After all, the Neryungri coal mine, the largest one in the eastern USSR, will soon go into operation and the tasks of the railroad workers will be considerably more complex.

[Question] But, powerful 3TE10M diesel locomotives are now operating on the small BAM. These locomotives can haul heavy and long trains, thus easing the burden.

[Answer] We will not be able to use the full potential of these locomotives. I simply can't imagine, who could sanction the construction of station tracks 850 meters long or how it could be done. In short, there is not enough time. There is no point in talking about long and heavy trains in the near future. I would like to add that these locomotives do not really satisfy our needs, due to their specifications. The BAM needs a special locomotive, capable of operating reliably in harsh climatic conditions.

Recently, a group of leading designers from the Voroshilovgrad Diesel Locomotive-Building Plant visited us. We expressed a number of our opinions to them. Our guests promised to deliver an improved locomotive as early as 1983.

[Question] Powerful modernized diesel locomotives require a corresponding repair base.

[Answer] That's absolutely correct. For this purpose, a large locomotive depot is being built in Tynda. The planned cost of the depot is 44 million rubles, but only 12 million rubles have been expended so far. This enabled us to put only the first phase into operation. Each year, one million rubles is authorized for construction of the depot. Thus, the depot will be completed in...30 years.

Things are even worse in other divisions. At Severobaykal'sk, only the ground for the depot has been cleared. Nor has construction begun at Urgal. So far, we are being bailed out by neighboring organizations, although they are very reluctant to help us. I can understand their reluctance. Their depots are working at capacity, even without our work.

The BAM workers are experiencing the same problems with "curing" the freight cars; there is no repair base, except for mechanized cleansing of empty cars in Berkakit.

[Question] Lev Veniaminovich, in all three rayon committees of the Railway Workers' Trade Union, we saw lengthening lists of railroad workers in dire need of housing. Yet, it appears that a great deal of housing is being built on the BAM.

[Answer] Yes, this is an acute problem. There are more than 5,000 workers in line for housing on the railroad. This problem gives rise to another problem--personnel fluctuation. Here is an example. The first all-union shock detachment of young railroad workers, 550 strong, arrived in the Tynda Division two and a half years ago. Four hundred and thirty of the workers stayed at the BAM, while 120 departed, basically due to the housing problem. It was too crowded for families in the nine-story modern dormitory.

Again, the problem arose due to gross miscalculations. For example, construction of temporary settlements should not have been allowed on the sites of the future main settlements. The workers began wearing out the temporary settlements and 25 percent of the apartments were thus lost for use.

And we must make special mention about what I think was the main miscalculation. No one foresaw that the birth rate on the BAM would be almost the highest in the country. We should be happy about the birth rate, but instead, we are perplexed.

[Question] Is there a way out of this situation?

[Answer] There is. I think that we must organize our own road-building trust or, at least, a construction and installation train. And we must build housing not with capital investments for the BAM, but with Ministry of Railways funds. We made such a request to the Ministry of Finance, but we were refused. We took another approach. Together with the Khabarovsk CPSU Kray Committee we proposed transferring the just organized "Urgalbamstroy" [Urgal

BAM Construction] Trust to the railroad. The trust would have worked as a subcontractor on the eastern section of the BAM. After the construction has been completed, the trust would have been stronger and more capable, and would have become a part of our collective. But this hasn't happened, and I still don't know why it hasn't.

[Question] Lev Veniaminovich, judging by the past winter, the railroad workers had a hard time in the main settlements.

[Answer] Yes, they did. We don't have a basic repair base for boilers on the main line. As you became convinced, boilers on the BAM consist of very complex equipment. There is no such equipment in the entire rail network. Furthermore, only highly-skilled specialists can operate the complex units. But where are we to get such specialists? Nowhere, so the only solution is to train such specialists ourselves. But how can we do this? It is hard for us to even find space for a training center, not to mention a teaching staff.

You can't help pay attention to the crowded conditions in which the departmental organs and engineering and technical personnel are housed in subunit offices. Almost everyone is in prefabricated sectional houses. The railroad workers do not have their own vocational and technical school. Similarly, the railroad does not have a technical school or a technicum, although construction of these institutions was provided for in a 1979 decree of the party and government.

Let's look at this problem from another point of view. The designers made the builders lay many kilometers of heating mains in perma-frost earth, to a depth of seven meters. Didn't they understand the peculiarities of municipal planning in the northern area of the country, where heating mains are only on the surface? Malfunctions are considerably easier to correct when the mains are on the surface.

On the BAM, a special degree of efficiency is required of the collectives at distant civilian structures; in a few minutes, they are to eliminate defects, for a delay might have catastrophic consequences. To do this, they need "technical ambulances," with their own vehicle repair shops and experienced maintenance personnel. Neither the branches nor the divisions have a motor vehicle pool.

Last winter presented us with an instructive lesson. The situation involving the thaw at Zolotnika settlement, for which the railroad workers were definitely to blame, was thoroughly investigated by us. The appropriate conclusions were drawn. In spring already, we began making more thorough preparations for the coming winter.

As you see, there are still quite a few problems for the BAM railroad workers. The problems must be solved and we are busy solving them.

9887
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## PROBLEMS AT CLASSIFICATION STATIONS DISCUSSED

Moscow GUDOK in Russian 30 Jun 82 p 2

[Article by I. Kokoulin from Orekhovo-Zuyevo: "The Station: Problems and Prospects"]

> [Text] For several days, representatives of all the railroads in the network, including traffic services specialists and station workers, studied the advanced experience of classification junctions in making efficient use of new equipment, improving production methods and economizing on expenditure of labor resources. The network-wide school was at the large Orekhovo-Zuyevo through-train factory. This station is equipped with highly-productive computers, various machinery and instruments.
>
> The participants in the school had a serious discussion of the prospects for developing the classification station; they also talked about overcoming the shortcomings connected with mastering modern technology.

Ye. Stepanov, chief engineer in the Main Administration of Traffic, designated Orekhovo-Zuyevo as being among the best classification stations in the rail network, having attained the highest level for handling freight cars in 1982. This through-train factory processes and prepares trains for the central areas, the Urals, Siberia, the northern and southern areas of the country, to bypass the Moscow center.

But no matter how important the station is, that still does not explain the constant attention which specialists pay to Orekhovo-Zuyevo. Most of all, they are interested in the fact that the workers remove more products from their own industrial areas than anyone else does. Freight car turn-around increased by more than one-third during the last 5-year plan and was attained at Orekhovo-Zuyevo with a reduction in staff (by 3.8 percent) at the station. What was this reduction due to?

Orekhovo-Zuyevo is a unique station as regards its equipments. Machinery has been installed at this station, which other classification centers do not have.

But as they say, equipment is lifeless without people. And there are places in the rail network where renovation was conducted, new machinery was installed, yet the rate of car classification remained at the previous level.

For a machine to work efficiently, its operation must be well organized; that is, the production process must be improved. The workers at Orekhovo-Zuyevo mastered the new equipment and creatively thought out how to use the equipment more efficiently. For example, the hump yard mechanisms at the station permit trains to be classified in parallel fashion. But if this is done unattentively, there will be no value to the operation. Therefore, depending on the destinations of the uncoupled cars in the trains, partially parallel, completely parallel and complete classification methods are used. These methods help reduce repeated processing of cars from classification tracks by 10 to 12 percent.

Based on the example of Lyublino, the workers at Orekhovo-Zuyevo are actively striving to reduce intervals between operations and are also making wide use of the experience of the Moscow railroad workers in increasing the length and weight of trains. Thus, all the classification stations of the Moscow Railroad making up such through-trains have reduced idleness for transitting cars during processing. What did this innovation provide to Orekhovo-Zuyevo? It helped the station increase the average weight of trains by 250 tons and increase the length of trains by four car-lengths. While the volume of work increased by 9 percent in 1981, the number of trains which were dispatched increased by only 2.5 percent. Such is the effect from introducing advanced methods of work.

Orekhovo-Zuyevo is not an isolated instance. At Bryansk-2, the workers began working under the slogan "from efficiency and quality at each work position to an enterprise with a high level of efficiency and quality for transport." This is not an easy matter, therefore the Bryansk workers are implementing it in a comprehensive manner. Here is just one example, described by A. Dem'yanushko, the station's chief engineer.

The car examiners were spending one and a half times as much time as was authorized to process trains in the departure yard. It turned out that their work was being delayed, due to the need to replace bearings. They decided to send the cars, which were found in the arrival yard to have such problems, to specialized tracks near the classification hump. Expanded crews of metalworkers were sent to these tracks. After the cars are repaired, they are broken up again by the hump. Of course, repeated classification increased by 100 to 150 cars per day. However, preparation of trains for trips was speeded up considerably.

The Comprehensive System for Control of Labor Quality (CSCLQ) was introduced for the first time in the rail network at the Nizhnedneprovsk Junction Station. At the Perm Classification Station, an automatic control system for classification stations, using a third-generation computer, is being successfully operated. The workers at the Minsk Freight Station are making extensive use of data from the railroad computer center to improve the scheduling of operations.

The example of these leading workers encourages other collectives at classification stations and helps improve the overall level of work. However, we cannot be satisfied with what has been achieved, because only 47 of the 100 largest classification stations met the norms for car idleness last year.

In 1982, the situation at many crucial stations has worsened. Idleness of transit rolling stock during processing has increased; there have been more instances of trains not meeting their schedules, delays due to non-acceptance of trains by stations, and cars being uncoupled because of technical and commercial problems.

The situation on the rail network cannot be explained merely by the harsh winter. The root of the problem lies in violations of production discipline and a low level of scheduling. Some station managers have resigned themselves to the fact that the production process lags behind contemporary demands.

In connection with the difficulties in handling the flow of traffic in certain areas of the rail system, some traffic chiefs are of the opinion that poor organization of train removal is the cause of stations' shortcomings. Therefore, less attention is being paid to observing the production process and organizing precise information.

As a result, during the first four months of 1982, compared with the same period in 1981, processing of rolling stock at the largest classification junctions decreased by an average of 13,000 cars per day. At some stations (Leningrad-Moscow Classification, Main Yaroslavl', Osnova, Karaganda Classification), not only was the task for classifying trains not fulfilled, but the work rates declined in comparison to 1981.

Under conditions of a continuously increasing volume of transport, it is very important to increase the transit flow of freight car traffic. However, this flow is decreasing and the number of violations of the plan for organizing trains is increasing. The workers at Baladzhary, Tbilisi and Khabarovsk-2 stations are more guilty of these shortcomings than anyone else. At these stations, the organizing of through-trains made up of empty cars is being arbitrarily cancelled. The empty cars are being added to freight trains, which cause additional processing at other classification junctions. Rtishchevo Station is sending its classified trains to Penza, even with cars to be returned. The participants in the school directed their attention to current shortcomings in introducing computer technology. There is an automatic control system now at 29 classification stations. In 1982, this system is to be introduced at another seven classification junctions.

We anticipate the creation of an automatic control system for mutually-linked stations over entire routes and areas. Then, each through-train factory will supply its neighbors and the railroad computer centers with trustworthy information about the composition of trains and the destination of freight cars. This can only be welcomed. However, the increased efficiency of the new systems will be hindered mainly by bad information among railroads, divisions and stations.

Mistakes in car numbers and network markings are being tolerated in commodity lists and telegrams. Codes which designate the freight and recipient are being entered incorrectly. N. Prokhorova, chief of the technical office at Georgiu-Dezh Station, stated that 40 to 45 percent of the documents which arrive at the station have errors in them. She also said that some markings are not made at all, which results in cars being sent to the wrong destination.

Without trustworthy information, a computer, like a human without eyes, operates blindly, makes mistakes and is thus unproductive.

Instead of correcting this problem, many managers of services, stations and traffic departments, particularly on the West Siberian, South Urals, Kuybyshev, North Caucasus and Donetsk railroads, deluge the ministry with complaints against neighboring organizations.

But we must establish high rates for processing of cars and improve the quality of train preparation. That is why the participants in the rail network school, in their recommendation, proposed that, first and foremost, the experience of Orekhovo-Zuyevo Station be widely introduced. They proposed that computers be more efficiently used, that supervision of fulfilling the plan for train make-up be tighter and that transport rates be increased in the second year of the 5-year plan to provide a worthy reception of the 60th anniversary of the formation of the USSR.

9887
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## FINNISH PRESS: RAIL CAR PLANT TO BE BUILT AT TOSNO BY FINNS

Helsinki HELSINGIN SANOMAT in Finnish 9 Sep 82 p 27

[Article: "Big Contract for Haka in the Soviet Union; Construction of Rail Complex Will Employ 350 Finns"]

[Text] The Haka Construction Company will be building a complex for the preparation and repair of rail cars in the town of Tosno located near Leningrad. The Finns will also supply half of the plant's heavy machinery, part of which has been especially designed for the repair complex.

The sale contract was signed on Wednesday in Moscow. The contract between the Haka Construction Company and V/O Sojuzvneshstroijimport is worth about 300 million marks. Construction will last almost 3 years and will employ about 350 Finns. Preliminary construction will begin immediately and construction proper in the spring of 1983. The plant will be turned over to the owners for guaranteed operation in the spring of 1985.

Once it is completed, the rail car complex will also serve rail traffic between the Soviet Union and Finland. For Finland, the contract means a new step toward pure construction jobs, the supplying of ready-made plants and thereby an extension of the exporting of Finnish know-how.

Haka's Own Project

For Haka and its export division, the contract represents the first foreign project of their own. Haka has previously taken on contracts in the Soviet Union as a partner of Finnstroi Oy [Finnish Construction Company], as general manager Eero Piipari described the importance of the contract.

The planning of the project, which involved special arrangements, and negotiations with the ordering agency lasted 2 years before resulting in an agreement.

Construction proper will begin in early spring of 1983. Preliminary construction will begin immediately. A residential area with housing, social facilities and mess halls will be built for the worksite as well as a number of storage facilities, among other things.

The plant will be turned over to the owners for guaranteed operation in the spring of 1985. Subcontracting will also be handled by Finnish workers.

The rail car complex will include a station for getting cars ready for traffic and a storage and repair shop with its auxiliary buildings and social facilities, altogether about 30,000 square meters covering several floors and about 250,000 cubic meters.

In addition to the construction of production facilities, open storage, underground oil storage, facilities for the rough cleaning of cars and other smaller buildings will be built on the site.

They will be capable of handling about 500 closed freight cars a day at the preparation station and about 6,000 closed freight cars a year at the storage and repair shop.

According to the contract agreement, construction technology planning, construction proper and the procurement of machines and equipment, which also includes participation with the ordering agency in the planning of the equipment of the plant, will be supplied.

Along with Soviet rail experts, Finnish experts and other consultants in that field have developed prototype machines for the project. The Lengiprotrans Planning Organization handled the planning for the ordering agency.

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## BRIEFS

RAIL CONSTRUCTION OVER TUNNEL--Severomuysk. Rails are beginning to be laid on the slopes of the Severomuysk Range. Construction of the bypass tracks over the main tunnel of the BAM [Baykal-Amur Main Line] has entered the critical stage. The best workers of the "Nizhneangarsktransstroy" [Nizhneangarsk Transportation Construction] Trust, victors in the socialist competition, won the honor of driving the first rail spike. The electrified branch line, approximately 26 kilometers in length, is being built in difficult conditions. Even the normal track-laying equipment can't be used in this work. That is why the rail sections will be installed with the aid of truck-mounted cranes and tractors. Despite these difficulties, R. Malov's crew has pledged to complete the entire bypass route over the Severomuysk Tunnel by the 60th anniversary of the foundation of the USSR. [Text] [Moscow GUDOK in Russian 3 Aug 82 p 1] 9887

NEW STATION--Issikan. A new point has been included in the traffic schedule for construction trains in the Urgal Division of the eastern section of the BAM [Baykal-Amur Main Line]. The first freight train arrived at Issikan Station from Urgal, after travelling more than 250 kilometers. Advancing westward from Fed'kin Klyuch Station, the construction workers left behind another 18 kilometers, reclaimed from the taiga and marshes. Delivery of materials and equipment to the main line's building sites has begun along the new set of tracks. Switches and station tracks are now being laid at Issikan Station. And the tracklayer continues its westward journey. By the 60th anniversary of the formation of the USSR, trains will be travelling as far as Fevral'skoye Station. [Text] [Moscow GUDOK in Russian 3 Aug 82 p 1] 9887

HISTORIC LOCOMOTIVE--Ryazan'. The FD Number 500 Series Steam Engine gave three blasts from its whistle before its final stop. The engine has been mounted on a pedestal at the Rybnoye Locomotive Depot in the Ryazan' Division of the Moscow Railroad. This very engine was the first to set out on a trip from the new depot in January 1936. Now, when they set out on a trip in powerful electric locomotives, the engineers will greet this venerable laborer of the steel rails with whistle blasts. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 17 Aug 82 p 1] 9887

TRACKLAYING IN EASTERN SECTION--Alonka (eastern section of the BAM [Baykal-Amur Main Line]), 17. (TASS). A loud soldierly "Hurrah!" pierced the silence at the Issikan Station in the taiga. Today, as provided for in the

obligations assumed in honor of the 19th Komsomol Congress, the tracklaying crew brought the steel rails to Issikan, having extended the main tracks of the BAM by another 30 kilometers since the beginning of the year. Officer A. Petrenko said: "Every meter of the route required enormous effort. Numerous rivers, bogs and rocky hills were left behind. The skill, sharpness and firm spirit of the Komsomol warriors helped us gain the labor victory. Both in winter cold and springtime mud, the men constantly over-fulfilled the daily norm." A smooth work rhythm characterized all the subunits of soldier-railroad workers on the eastern section of the BAM. [Text] [Moscow GUDOK in Russian 18 May 82 p 1] 9887

CSO: 1829/323

# TIGHTENING UP MARITIME TRANSPORT ECONOMY

Moscow MORSKOY FLOT in Russian No 7, Jul 82 pp 2-3

[Article by V. Nikolaychuk, deputy minister of the maritime fleet:"Unfinished Tasks"]

[Text] Maritime transportation enterprises have made a good start on the 11th Five-Year Plan. Henceforth, the rate of development of the industry and the success in fulfilling the tasks established by the plan will be determined by the level of operational leadership and management in production, the effectiveness of using the principal fixed assets, by elevation of the operational, economic, and financial operations at the the enterprises, and by the ability to find potential resources and involve them in production.

Each five year plan has its own peculiarities, its singleness of purpose. In accordance with this, the work of the industries is drawn up. In the 10th Five-Year Plan, the emphasis was put on a significant increase in the efficiency and quality of work. In the 11th Five-Year Plan, the assignment is to intensify production while not reducing the rates of further increases in the efficiency and quality of operations.

Maritime transportation basically secured the fulfillment of the assignments of the 10th Five-Year Plan. The development of the industry over these years is characterized by the following data.

Fixed production assets increased by a factor of 1.6 and profits by 34%. Cargo haulage in all forms of navigation was increased by 14%, cargo turnover by 15.2%, and the volume of loading and unloading operations by 12%.

At the end of the 10th Five-Year Plan the industry's fleet was composed of 1748 ships with a deadweight of 18.5 million tons and a transport capacity of 230 million tons of cargo per year.

The 10th Five-Year Plan will occupy a worthy place in the history of the achievements of the Soviet people. The results of the plan confirmed the correctness of the economic strategy worked out in the 24th and 25th Congresses of the CPSU - a strategy directed toward the intensification of the development of the production and economic system, and increasing the efficiency and quality of work.

Maritime transport was called upon to satisfy the demands of the national economy and the population for transportation, to assure the independence of Soviet foreign trade from foreign ship owners, and to use financial, material and labor resources most efficiently and economically.

In The Fundamental Directions for the Development of the USSR in the Years 1981-1985 and the Period up to 1990 adopted by the 26th Congress of the CPSU, the main tasks of maritime transport in the 11th Five-Year Plan are defined as: the full and timely satisfaction of the demands of the national economy and the population for transportation and increasing the efficiency and quality of the operation of the transportation system. In this it is necessary:

- to upgrade the use of the fleet, ports and ship repair plants and to improve the organization of the transportation of cargoes and passengers and the effectiveness of exporting transportation services;
- to enrich the fleet with specialized ships - containerships, lighter carriers, railroad ferries, ships for Arctic navigation, icebreakers and nuclear powered ships;
- to provide for year-round navigation in the western part of the Northern Sea Route and for timely delivery of the necessary cargoes to the regions of the Extreme North and the Far East.

Proposed as the basis for the development of the material and technical foundation of the industry is further renovation of the fixed assets by the technical reequiping and modernization of existing enterprises.

A feature of the 11th Five-Year Plan for maritime transport is that it envisages a rate of growth in the end product which exceeds the rate of growth of capital investment and material and labor resources.

Analyzing the results for 1981, it can be concluded that the rate of social and economic development of the industry turned out to be somewhat higher than contemplated by the Plan in the first year. The growth of transport fleet haulage of national economy cargoes in coastal navigation amounted to 5.9%, the growth of the financial indices for fleet operation in foreign navigation was 12.5%, the growth of loading and unloading work in ports was 7.6%, while the average annual rates of growth envisaged in the Plan were 1.0%, 8.9%, and 1.4% respectively.

One of the key tasks of the workers in the industry is to assure the fullest and most efficient use of fixed production assets.

Over the past 10 years the fixed assets of maritime transport grew by a factor of 2.3. But this was not simply a quantitative growth; primarily it is a growth in quality. The composition of the fleet was changed. The proportion of specialized ships increased from 30% in 1970 to 44.7% in 1980. There was a growth in the number of highly productive, technically improved, and very expensive ships - containerships, Roll-on/Roll-off ships, ferries, bulk carriers, and ships for Arctic navigation. These changes in the fixed assets of the fleet were brought about by the more complex and responsible assignments confronting maritime transport.

The development in the northern regions of the country of the enterprises of the mining and metallurgy, petroleum and gas industries requires the organization of year-round transportation in the Arctic basin. To secure reliable transportation of cargoes throughout the whole year, powerful icebreakers and cargo ships of the class reinforced for navigation in ice are necessary.

The increase in the transport of motor vehicles and wheeled equipment and the haulage of cargoes with enlarged dimensions lead to a growth in the number of Roll-on/Roll-off ships.

The growth in haulage of expensive articles (instruments, electronics, light industrial goods, etc.) was conducive to the development of the transportation of cargoes in containers and to the expansion of the construction of containerships.

All these expensive transportation facilities, designed for the accelerated delivery of cargoes to consumers, require increased rates of processing in ports and the reduction of idle time.

The intensification of the use of the new transportation facilities should be provided in the first place by an increase in the level of operations, by a maximum curtailment of repair time, by prolonging periods of operation, and by reducing idle time in cargo operations to the minimum.

Many of these problems still have not been solved. The idle time in ports of the specialized ships substantially exceeds the specified time; consequently, the advantages of the specialized tonnage still are not being fully realized.

Idle time in port for the fleet, including that of the specialized fleet operating on shipping lines, remains high. Thus, the idle time of Roll-on/Roll-off ships of the "Nikolay Cherkasov" type in the ports of Odessa and Il'ichevsk amounts to 37% of operating time, for the containerships of the "Pioner Odessa" type, it is 47%, and for the Roll-on/Roll-off ships of the "Akademik Tupolev" type in the port of Zhdanov, it is 26%.

This happens because the technology of processing specialized ships in ports is insufficiently perfected. Shipping company cargo-handling parties are not made ready in timely fashion, and ships stand for several hours awaiting the drawing up of cargo documentation.

The technical changes and improvement of the cargo fleet have placed new demands on port operations.

In the development of ports, the construction of specialized transshipment complexes and terminals has begun to predominate. During the 10th Five-Year Plan, transshipment complexes with about a 45 million ton capacity were put into operation including: the ferry complex at Il'ichevsk, the complexes for the transshipment of coal and wood chips at Vostochniy, and the container terminals in Il'ichevsk, Leningrad, Arkhangel'sk, and Magadan.

The effective use of these expensive and principal fixed assets of the fleet and the ports requires a number of measures embracing questions of planning, management, analysis, and the perfecting of systems for organizing finances and accounting.

Increasing the intensity of the use of transportation facilities, especially in ports, in many respects depends on perfecting the organization of labor. Losses of working time in ports because of daily and intrashift idlenesses alone amounted to 99,700 man hours in 1981.

It is necessary to improve the use of working time significantly and to take radical measures to assure the steady operation of the fleet and the ports and to increase the engineering training for production and management. Without this it is impossible to secure a high level of use of the technically improved assets of transportation enterprises.

The renovation of transport technical means, the increase of the tonnage of modern specialized ships, and the construction of high productivity transshipment complexes in ports has significantly accelerated the production processes. In the realm of economics and finances, the needed reflection of this acceleration still has not been obtained. Thus, the turnover in working capital for 1981 amounted to 41.7 days. In 1971 it was 43.7 days; that is, over 10 years it was accelerated only 4.8% while the total amount of working capital during this time grew 69.9%.

It is necessary to keep in mind that an acceleration of working capital by only one day releases millions of rubles to the industry which can be directed to other purposes; for instance, capital construction.

Serious sloppinesses take place in the use of working capital. Above normal balances of operational supplies,not credited by the bank for operational purposes, on 1 January 1982 amounted to 14.6 million rubles as against 12.8 million on 1 January 1981.

The total supplies of materials at maritime transport enterprises reached the extremely impressive dimensions of 254 million rubles. The Kamchatka Shipping Company has the largest supply of materials - enough for 450 days of uninterrupted operations. The Black Sea Shipping Company has supplies for 196 days, the Baltic Shipping Company, for 291 days, and the Far Eastern Shipping Company, for 231 days. Are such supplies of operational goods and materials economically justified?

The accumulation of materials in amounts not called for by production processes leads to diverting funds from circulation and to a direct financial loss.

In the 10th Five-Year Plan, for maritime transport enterprises, for all kinds of activities, a quota in the sum of 45 million rubles was established for drawing material resources and equipment into circulation. This quota was not fulfilled. The resources and equipment drawn into circulation amounted in all to 35 million rubles.

There is a large debt liability. For 1981, for all kinds of activities of the maritime transport enterprises, although somewhat reduced, it still amounted to the very large sum of 63.8 million rubles.

In addition, according to bills not paid on time for the transportation of cargoes for foreign charterers, there is a substantial debt of foreign firms.

In diverting internal resources for above-normal operational supplies and uncollected debts, enterprises of the industry frequently turn out to be unable to pay in full from their own funds for financing capital investments and are compelled to make use of USSR Stroybank [Construction Bank] loans, paying very substantial sums to discharge them.

The total indebtedness of maritime transport enterprises for payment of internal capital for financing capital investments on 1 January 1982 was 5.9 million rubles.

For 1981 at the enterprises, for some of the basic activities, nonproductive expenditures and losses amounted to 57 million rubles and grew by 25% compared with 1980. Basically, these are payments for demurrage, losses from nonreserved haulage and transhipment of cargoes, expenditures for the liquidation of emergencies and their consequences, and some other purposes.

An increase of monitoring for timely receipt of revenues and strictly substantiated expenditures of funds, improvement of the statement of financial operations and improvement of the system of accounting have substantial potential for increasing the efficiency of operations of transport enterprises.

The economy must be economical - this is the slogan of the 11th Five-Year Plan. But to put this into practice, it is necessary to give the economy daily attention, to economize in the large and small, and to keep the operation of every enterprise under constant observation.



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# REGIONAL COORDINATION OF DIFFERENT TRANSPORTATION SYSTEMS

Moscow MORSKOY FLOT in Russian No 7, Jul 82 pp 10-12

[Article by Cand Tech Sci I. Orlov, deputy chief of the GKhO "Yuzhflot" (The State Economic Association, "Southern Fleet"): "Regional Transportation Centers Are To Be"]

[Text] The coordination of the operations of interfacing transportation systems with mutually coordinated planning in transportation centers, according to the experience of the Leningraders and approved by the CC CPSU, has acquired great scope. Local transportation centers based on sea and river ports, industrial enterprises, and railroad stations are resolving the state task of accelerating the progress of freight.

But life goes on, and now, more actively, questions are being raised about expanding the framework of coordination; that is, about coordination on a higher level both in the scope of the problems being resolved, and at a higher level of management in the bodies and organizations who should coordinate their activities.

The 26th Congress of the CPSU put before transportation workers the task: to improve the coordination of the operations of all forms of transportation and the interaction of them with the industries of the national economy, and to introduce improved technology for transportation in interfaced service.

In 1981 the Collegium of the Ministry of the Maritime Fleet considered the question of the work of the GKhO "Yuzhflot" in the improvement of the coordination of the operations of shipping companies and ports with the interfacing transportation systems on the basis of continuous planning in a system of regional transportation centers. It was noted that in the southern basin work had been done on expanding and deepening communications with interfacing transportation systems and other organizations, and that experience had been accumulated on joint operations with the republic ministries for procurement, commercial motor vehicle transportation, river transport enterprises, and others.

By that time, the geographic division into districts as related to the nature of the freight traffic, the specializations of the ports, and the orientations of the large river basins had been clearly defined.

Entering into the Black Sea - Dnieper River regional transportation center are the zones of operation of the Black Sea and Soviet-Danube Shipping Companies, the Odessa and Moldavian Railroads, the principal river fleets of the Ukraine and Moldavia, the southern administration of Minavtotrans [Ministry of Motor Vehicle Transport] UkSSR, the river ports in Il'ichevsk and Sevastopol, the Dnieper-Bug port and others.

Entering into the second transportation center are the Azov and Novorossiysk Shipping Companies, the Donets, Dnieper-region, and Northern Caucuses Railroads, the Volga-Don River Shipping Company, the Administrations of Motor Vehicle Transport of the UkSSR and RSFSR, the fishing port in Kerch, and the fishing and timber ports in Novorossiysk.

The third regional transportation center envelops the zone of operations of the Georgian Shipping Company, the Transcaucasian railroad, the Georgian Ministry of Motor Vehicle Transport with outlets into Armenia and Azerbaijan, and also the ports of Baku and Krasnovodsk connected together by a ferry crossing.

The expansion and deepening of coordination on the scale of transportation regions permitted the resolution in a new way of many questions, the increasing of the permanence of measures worked out, and increasing the amounts of working capital and capital investments involved.

Thanks to coordination in the regional framework, a significantly increased volume of import cargoes was successfully assimilated. In the Black Sea- Dnieper regional transportation center in 1981, 32.6% more cargo was dispatched to consumers than in 1980. In the Azov-Volga region, the growth of the delivery of import cargoes amounted to 52.9%, and in the Transcaucasian region, to 28%. In this, river transport in the southern regions transported more than 1 million tons of import cargoes alone. More than 120,000 tons of import cargoes were taken out of seaports by motor vehicle transport. Through port elevators, more than 2 million tons of grain were despatched on railroads and 200,000 tons of import cargoes were transshipped in the fishing ports. Strengthened business communications with the help of the Ukrainian rivermen permitted organizing the haulage of sulphur in an intricate transportation scheme: by seagoing ships to the roadstead of the port of the Mouth of the Danube, thence on river ships to the Nikolayevsk river port and to the port of Reni for subsequent shipment on railroad cars. For the first time, to the river ports of the Dnieper almost 300,000 tons of grain were forwarded through the port of Kherson. Included in this was the completion of experimental voyages with bagged grain cargoes on ships of the river-and-sea type right up to Kiev.

Next, joint transportation began to be carried out at the Azov-Volga regional transportation center. The first import cargoes were dispatched from Zhdanov to Moscow. Somewhat later, grain began to be transported in river ships from Azov to the Volga, and part of the import cargoes began to be hauled from Zhdanov by motor vehicle.

In the Transcaucasian regional transportation center various transportation schemes were tried out including moving bagged freight by seagoing and river ships from Poti to Baku with subsequent transport by motor vehicle, and also experimental, highly intense motor vehicle trips with transit containers from Poti to Dzhulfa.

Work on the widespread involvement of the ports of Reni, Izmail, Berdyansk, Skadovsk, Taganrog and Tuapse and many river and fishing ports on the Black Sea in the transshipment of import cargoes played a special role in strengthening the comunications of regional transportation centers with the associations of the MVT [Ministry of Foreign Trade], the Ministries of Trade of the USSR and the union republics, and the Ministies of Procurement of the USSR, UkSSR, and RSFSR.

Thanks to the improved coordination of the operations of enterprises and organizations of many departments, in 1981 alone 54,000 rail cars which would have been lost for hauling import cargoes because of the overloading of the big ports, were successfully freed up.

Within the framework of the coordinated activities of the departments, the material and technical base for carrying out freight operations is being developed. In 1981 three USSR ministries, the Ministry of the Maritime Fleet, the Ministry of Railways, and the Ministry of Procurement, signed a joint order about increasing the throughput capacity of the elevators in the ports of Odessa, Kherson, Nikolayev, and Poti for the transshipment of grain. The realization of several of the points in this order already has yielded specific results in the regional transportation centers. For instance, the transshipment complexes of pier No. 7 of the port of Odessa have been modernized, and the elevator complexes No 7 in Nikolayevsk and No. 17 in Poti have begun to receive seagoing ships.

Soyuzmorniiproyekt [The State Planning, Design, and Scientific Resaearch Institute for Maritime Transport of the Ministry of the Maritime Fleet USSR] and its branch Chernomorniiproyekt [The Black Sea Planning, Design, and Scientific Research Institute for Maritime Transport], which have been producing the technical documentation specified in the order of the three ministries, are working on the prospective uses for the elevator complexes in Novorossiysk and Zhdanov.

In our opinion, the regional transportation centers should become the middle link in the coordination being accomplished at state level by government commissions and Gosplan USSR, and at the localities by the transportation centers on the base of the ports and railroad stations. The absence of this link in a continuous system of coordination substantially increases the expenses in the transportation system as a whole.

The high level of coordinated operations being accomplished in the regional transportation centers will permit responding operationally to arising delays in the passage of freight, and it also will permit the creation of a unified basis for standards.

In the stage of the formation of the regional transportation centers, the necessity for the development of a basis for standards has called into being several forms defining the interrelationships of interfacing transportation systems. The GKhO "Yuzhflot" for the past several years has been signing agreements with Glavrechflot [The Main Administration of the River Fleet] of the Ukraine, and, in 1981, agreements with the Ministries of Motor Vehicle Transport of the Ukraine and Georgia were signed.

By means of regional coordination, continuous planning on the basis of annual and quarterly plans for the transfer of cargo from one kind of transportation to another will be successfully secured. In our opinion, only regional transportation centers allow the formation of a transportation technological system for the different freight traffic volumes on a "door to door" basis.

Such a comprehensive approach to the transportation of cargoes opens wide opportunities for mutual coordination of the Plans for the passage of cargo at all stages. The Plan becomes,for the different departments, not just a dissociated monitoring of assignments at each stage of shipment but a unified through transportation model that will avoid stoppages or delays in the transport of cargoes when they are already on the way.

Annual planning of joint operations in volumetric indices with the indication of deadlines in the framework of a transport region is promising, and, from the point of view of increasing the effectiveness of the use of transportation facilities, the proportion of through transshipments is increased, and the time for the delivery of cargoes to consumers is reduced. Opportunities emerge to secure a high level of the productive effectiveness of through consignments (by containerization and packetizing).

Side by side with the three southern centers which are being formed in a process of joint operations in interfacing transportation systems, the Leningrad, Northern (center in Arkhangel'sk), and Far Eastern (center in Vladivostok) regional transportation centers are all reasons for expanding the coordination of operations into the Baltic region.

A regional transportation center should not be considered as some management superstructure, but as a manifestation of a higher form of administration based on the community of purposes and tasks of interacting organizations and on the combined ideas of state interests whose leaders participate in unified joint coordination work without remuneration. To facilitate multilateral communications and to coordinate their activities with the work of neighbors for the sake of improving the transportation of cargoes - regional transportation centers make available precisely such opportunities. This link in the coordination of transportation operations is missing today, but it is being born and it is necessary to give it full citizenship in the transportation system.

Soyuzmorniiproekt has started on the development of matters for the formation of transportation technological systems in regional transportation centers. The assignment is very complex and involves many Plans but at the same time, it is one of the most urgent for maritime transport.

An important role in the organization of successful operations in regional transportation centers belongs to the maritime shipping companies. They must support the operational groups in complex coordination work.

Regional transportation centers have declared themselves as a necessary and effective link in the coordination of the transportation and transhipment of freight. The organizations of maritime transport can have an active influence on the formation of this link in the unified transportation system of the country and that will be our contribution to the business of the full and timely satisfaction of the national economy and the population for transportation.



9136
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# DEVELOPMENT OF WATERWAYS

Moscow RECHNOY TRANSPORT in Russian No 5, May 82 pp 35-36

[Article by Candidates in Technical Sciences Ye. Makhlin and Ye. Kondrakhova and Engineer N. Kozhevnikov: "The Development of Waterways"]

[Text] River transport is an important component part of the country's single transportation system. At the present time, 146,000 kilometers of waterways are navigable, which is approximately equal to the length of the operational general use railroads.

During the years of the five-year plans there has been carried out a fundamental reconstruction of the internal waterways with overall hydrotechnical construction at its basis. The large inter-waterway connections which have been built--the Belomor-Baltic, the Moscow-Volga, the Volga-Don, and the Volga-Baltic--possess high technical parameters. They greatly improved the layout of the internal waterway network, and united the deep waterways of the European part of the country into a single system. The favorable preconditions were thereby created for the efficient transportation of large freight flows of coal, timber, grain, construction materials, and petroleum and chemical products in intra-rayon and inter-rayon communications. At the present time, the Single Deep Water System of the European part of the USSR comprises only 4.3 percent of the total length of our internal waterways, but accounts for more than two-thirds of the shipment operations by the country's river transport.

Great opportunities have opened up for the development of shipping between river and ocean ports in coastwise and foreign shipping without the trans-shipment of cargoes in estuary ports.

As a result of the filling to its planned level of the Kanev Water Reservoir on the Dnepr over a 1,000-kilometer sector from Kiev to Kherson, a single guaranteed depth of 3.65 meters has been established which permits the operation on this important main waterway of large tonnage ships and rolling stock.

The development of navigation on the Dnepr was hindered by the old three-chamber lock whose traffic capacity had been practically exhausted. This led to substantial fleet stoppages during the waiting for locking. Certain shipments which gravitate toward river transport had to be shifted to the railroad. In addition, the chamber dimensions of the old lock excluded the possibility of using the largest modern ships and rolling stock on the lower Dnepr.

In 1980 the second thread of the Dnepr lock imeni V. I. Lenin went into operation: its dimensions were designed to permit all types of modern large-tonnage vessels, and its traffic capacity provided for the growth of freight and passenger traffic over the long term. As early as the near future there will be a substantial increase in the amount of river shipments in this section on the basis of a shift from the railroad of part of the coal, ore, and construction material flows. This will make it possible to decrease the adduced expenditures for the delivery of freight by almost three million rubles a year, and to decrease railroad transport freight turnover by more than two billion ton-kilometers.

It should also be noted that in recent years navigation conditions have been improved on the Dnepr-Bug Canal. A number of hydrotechnical installations have been reconstructed here, and the depths have been increased by means of earth removal. A navigable canal of around seven kilometers in length has been built from the Pripyat' River to the new port of the mineral and construction materials combine in Mikashevichi on which up to two million tons of crushed stone are shipped to the construction sites of Belorussia and the Ukraine. On the Pripyat' the Volyanskiye Mosty-Pkhov sector is a limiting one because it is impossible to increase the guaranteed depths there by means of earth removal. The problem can be solved after the construction of the Ust'-Vetlitsk Hydroengineering Complex which will make it possible to create a transit waterway with a single depth from Brest to Chernobyl'.

It is necessary to take account of the interests of river transport when improvement and other water resources operations are carried out in the waters of the Dnepr, Pripyat', Sozh, Berezina, Neman, and in the Dnepr-Bug Canal Zone. However, consideration is not always given to these matters when improvement structures are planned.

In the eastern areas of the country overall hydroengineering construction did not bring about an essential improvement in the navigation conditions as a result of the incompletion of the cascades of the hydroengineering complexes, and also an insufficient consideration of the interests of water transport in determining the water passage allowances. Moreover, the situation in a number of cases even worsened. For example, on the Angara, owing to the relatively small estimated shipment volumes, ship passage installations were not built and shipping is carried out on sectors of the river which are isolated from one another. On the basic part of the riverways in the eastern areas shipping conditions have improved as a result of line work. In recent years the guaranteed depths on Siberian rivers have been increased by 10-20 centimeters, and on the heavy-traffic sectors of the Irtysh, Ob', and Yenisey they have been brought to 2.5-3 meters. On the waterways on which freight is brought to the petroleum and gas extraction areas the guaranteed depths have been increased to an even greater extent during the past 5-year period: on the Pur River--by 20-60 centimeters, Nadym--25 centimeters, and on the Vakh and Agan--by 15 and 20 centimeters.

The basic directions for the economic and social development of the USSR for the years 1981-1985 and for the period until 1990 provide for a substantial

increase in the role of river transport in meeting the economy's and population's needs for shipments: during the 11th Five-Year Plan its growth rates will be 1.5 times higher than the analogous indicators for the railroads and more than twice as high as those of ocean transport. Shipments in the rivers of Siberia and the Far East will develop at more rapid rates. During the five-year plan their volumes will increase by 30-32 percent, and wider use will be made of the possibilities of river transport for easing the load on railroads with intense traffic.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Develop River Transport in 1981-1985" stipulates that 30-40 million tons of coal, ore, petroleum and petroleum products, timber, and other freight be shifted from the railroads to the internal waterways.

In order to accomplish the tasks which have been set for river transport measures will be carried out to substantially strengthen its material and technical base and, above all, to fully meet the economy's needs for freight shipments in the areas of Siberia, the Far East, and the north. It is planned to improve the navigation conditions on these rivers above all through a further increase in line work.

In the eastern part of the country navigation conditions will be determined for a long time yet by free river sectors. Here it remains important to construct ship passage installations as a part of hydroengineering complexes on the large Siberian rivers.

The importance of the waterways for the above areas does not decrease even when railroads are put into operation. When the latter are built there usually occurs a redistribution of freight flows between river and rail transport. However, this does not at all mean a decrease in river shipments. On the contrary, the commissioning of railroads is usually accompanied by a rapid development of the productive forces in a given zone which, in its turn, gives rise to a corresponding increase in shipping work which is performed by all types of transportation. Thus, when the Tyumen'-Tobok'sk-Surgut Railroad came out to the middle Priob' the amount of freight shipments by river transport increased there. An important task of river transport in the country's east and north is to provide for the delivery of freight to the petroleum and gas bearing areas of the middle and lower Priob', and of the north of Tyumen Oblast.

The upper sector of the Lena River is a serious obstacle to increasing the amount of shipments to the northern rayons of Irkutsk Oblast and the Yakutsk ASSR. During the last 20 years the guaranteed depths in the Osetrovo-Vitim sector, the most difficult for navigation, have been increased by 1.4 times by means chiefly of earth removal and leveling work. The amount of earth removal increased by more than 10 times compared to 1960, and, moreover, every depth increment of 10 centimeters demanded a multiple increase in the amount of bottom deepening.

The increase in the guaranteed depths promoted an important rise in the effectiveness of the transportation fleet's operations and the reliability of this important transportation main line which provides for more than 60 percent of the freight deliveries to the enormous, rapidly developing north-eastern area of the country. However, the actualization of the depth which has been established on the upper sector of the Lena remains low--an average of around 75 percent--while in individual low water years it decreases to 50 percent, which creates great difficulties for the delivery of freight by river transport. A further increase in the normed depth of the Osetrovo-Kirensk sector of the Lena, the most difficult for navigation, by means of earth removal is impossible insofar as a deepening of the channel would lead at the same time to a sharp decrease in the water levels. The shipment of a part of the freight for the areas of central Yakutiya by railroad, truck, and other types of transport can be regarded as more expedient.

Very substantial work will have to be performed during the current decade to improve and develop the internal waterways of the European part of the country and, above all, of the Single Deep Water System.

In connection with the tasks posed by the 26th CPSU Congress of making wider use of the capacities of river transport to relieve the railroads in a number of freight-intense directions, measures are supposed to be carried out to develop the traffic capacity of individual sectors of the waterways. After the completion of the construction of the second thread of the Sheksna Lock it will become possible to shift part of the freight from railroad transport to river transport and to increase the amount of inter-rayon and long-distance intra-rayon shipments on the Volga-Baltic Waterway. This will make it possible to economize 2.7 million rubles of adduced expenditures annually.

The filling of the reservoirs of the Cheboksary and Nizhnekamsk State Hydroelectric Power Stations to their normal planned water levels will also promote a fuller and more effective use of our internal waterways. As a result of the construction of the Konstantinov Hydroengineering Complex, depths of up to four meters will be ensured on the most freight-intense sector of the Don from the Tsimlyansk Hydroengineering Complex to the Ust'-Donetsk Port: this will make it possible, through a better use of the fleet, to decrease adduced transportation costs by approximately 2.5 million rubles a year, and to substantially reduce the dependence of navigation on the amounts of water which are passed into the lower reach of the Tsimlyansk Hydroengineering Complex.

Thus, depths permitting the operation of large tonnage modern ships and echelons will be created on all of the basic waterways of the European part of the country: on the Volga from Kalinin to Astrakhan', on the Kama from Solikamsk to the mouth, and on the Volga-Don Waterway from Krasnoarmeysk to the port of Ust'-Donetsk.

In order to determine the optimal depth in the rivers of the Deep Water System of the European part of the country studies have been conducted in the Institute of Overall Transportation Problems at Gosplan USSR. The technical and economic

substantiation of the dimensions of the waterways was performed for freight flows for whose mastery large tonnage ships and echelons should be used. Comparing them to the total volume of shipments in the Single Seep Water System showed that freight whose delivery requires an increase in depths comprises 62 percent of the freight turnover and 31 percent of the volume of shipments. Since ships of the transportation fleet with a future (increased) displacement will be put into operation gradually, it is clear that in the depth variants of up to 4.2 meters (displacement of up to 3.7 meters) all of the shipments are made by ships of the transportation fleet with a contemporary displacement. At depths of 4.5 and 5 meters (displacement of more than 4 and 4.5 meters) 80 percent of the freight turnover is carried out by the fleet with contemporary displacement and 20 percent by ships with future displacement.

In the locking systems the guaranteed depths are limited basically by the depths at the thresholds of the locks. After the filling of the Cheboksary and Nizhnekamsk Reservoirs to their normal water lever a depth of 4.2 meters with an actualization of 96-99 percent which is required for main line rivers will be established in all of the thresholds of the locks of the Volga and Kama. In order to create a uniform depth of 4.2 meters in all of the waterways of the Single Deep Water System of the European part of the RSFSR it is necessary to have a partial reconstruction of the Volga-Don and Volga-Baltic Canals, and also the construction of the Bagayevskiy Hydroengineering Complex on the Don. In order to ensure a depth of 4.5 meters it is necessary to build an additional thread for the Gorodetsk Lock with a lowered threshold, and also to perform substantial capital work on the above canals. An increase in the guaranteed depth to 5 meters will require the construction of third threads for the Rybinsk, Gorodetsk, Kuybyshev, Balakovo, and Volgograd Locks, and expenditures for the reconstruction of the Volga-Baltic Canal and the construction of an additional lock for the Volga-Don Shipping Canal.

An increase in depths in the Single Deep Water System also requires a definite amount of earth moving work. A comparison of the total expenditures for freight shipments, hydroengineering construction, and line work with different guaranteed depths (4; 4.2; 4.5; and 5 meters) has shown that the optimal guaranteed depth for the waterways of the Single Deep Water System in the immediate future will come to 4.2 meters. An increase in this depth will require a sharp increase in hydroengineering construction and earth moving work, the expenditures for which exceed the economy on shipments which can be attained by using larger ships.

In the future the effectiveness of increasing the depths of the waterways of the Single Deep Water System will to a substantial extent be determined not only by an increase in shipments, but also by the amount of irretrievable water consumption in the Volga-Kama Basin, and by the amounts and schedules of the work to shift a part of the northern rivers into the Volga and Kama.

Ships with a displacement of 3.5 meters demand the construction on the Dnepr of second threads for the Kanev and Dneprodzerzhinsk Locks, the locking of the lower Pripyat', the reconstruction of the upper head of the Kakhovka Lock,

and the performance of rock removal, earth, and other types of work on the Kakhova and Kremenchug Reservoirs. Calculations have shown that the operation of ships with a displacement of 3.5 meters on the Dnepr is inexpedient since it will cause an increase in lump and current expenditures.

Thus, even in those cases when the hydroengineering construction necessary for a fundamental improvement of waterways is of a relatively small amount, an increase in depths can only be expedient when there are large volumes of shipments (more than 15-20 million tons) and when there is a substantial improvement of navigation conditions on waterways of substantial length (1,000-1,500 kilometers). If, however, it is a matter of the incompletion of the cascades of hydroengineering complexes (the presence of individual short sectors) which is holding back the development of shipments in large vessels on long routes, or a matter of a lack of correspondence between individual installations and ship passage dimensions, the elimination of this gradation of depths is, as a rule, economically effective.

An improvement of navigation conditions on the Volga-Don Canal requires additional special research. During the last decade navigation on it has begun to be limited by Lock No. 1. The point is that as long as a transit depth of 3.65 meters had been guaranteed on the Single Deep Water System the navigation depth on the lower threshold of Lock No. 1 was sufficient for the passage of all existing types of ships even during low water years. However, with the increase of the single transit depth to 4 meters there began to quite frequently occur derangements of the navigation depths in this lock caused by a decrease during low water years of the amounts of water passed from the Volgograd Reservior and the lowering of levels in the lower reach of the Volgograd Hydroengineering Complex. With an expenditure of 3,400 cubic meters per second the guaranteed depth decreases to 3.5 meters, while with an expenditure of 3,200 cubic meters per second it decreases to 3.2 meters. A guaranteed depth of 4-4.2 meters can only be ensured with an average daily expenditure into the lower reach of the Volgograd Hydroengineering Complex of no less than 4,000 cubic meters per second. This kind of water expenditure in the future with an increase in the amounts of irretrievable water consumption from the Volga and Don will greatly increase the strain on the water balance in the section of the Volgograd State Hydroelectric Power Station.

In order to provide additional water to the Don variants of transferring part of the flow of the Volga, including transfer tracts without navigation installations, are being considered. Calculations show that the transportation use of any transfer tract (both from the upper and from the lower reaches of the Volgograd State Hydroelectric Power Station) is apparently of equal effect. The shifting to waterways of additional shipments from overloaded rail directions would make it possible to decrease freight delivery expenditures by 25-30 percent.

The prolonging of the navigation period on the internal waterways is an important economic task. At the present time, more than 80 percent of river transports shipping work is performed on waterways with a navigation period of up to 220 days. The seasonal nature of river transports operations can be compen-

sated for by the creation of inter-navigation period reserves by freight shippers and receivers. In recent years a number of measures have been carried out which increase the operations period of individual sections of the waterways. Transport vessels are being built for operations during a prolonged navigation period. The river fleet is being built up with powerful ice-cutters and other ice-cutting equipment. Measures are being carried out to ensure the work of navigations installations and ports during the winter period. Calculations and an analysis of the first work results during the winter period show that the prolongation of the navigation period and the attainment of year-round shipping on the most freight intense sectors where there is a heavy work load on the railroads produce a substantial economic effect, and make it possible to substantially mitigate the negative consequences of the seasonal nature of operations on the internal waterways and to increase the reliability of river transport operations.

Thus, the development task for the internal waterways of the Single Deep Water System of the European part of the country remains an improvement of navigation conditions, the ensuring of a guaranteed depth of 4.2 meters, and the effective use of the navigational period and its prolongation.



2959
CSO: 1829/252

## KHOLMSK PORT FACILITY GROWING PAINS

Moscow MORSKOY FLOT in Russian No 7, Jul 82 p 15

[Article: "Problems of the Port of Kholmsk"]

[Text] Construction of the second stage of the Vanino-Kholmsk ferry crossing, which should be in service by the end of the current Five-Year Plan, proceeds at full speed. The whole water area of the port is being deepened. The breakwater, which formerly protected the shore but now stands as a barrier on the way to a new pier, is being blasted. The shore in this locality has been reinforced with huge concrete quadruple-sole barriers. Here there will be domestic and service accomodations. A quay is being constructed which promises to become convenient for strolling townspeople.

Concurrent with the construction of the second stage of the ferry terminal, a renovation of the eighth pier is being carried out. It will be extended up to the ninth and tenth piers. In starting this work, the port workers by their own means attempted to correct the serious under estimates of the planners who supposed that the amount of freight processed in the port by the customary methods will not be increased even in the remote future. By proceeding from this, the engineers of Kaspmorniiproyekt [The Caspian Planning, Design, and Scientific Research Institute for Maritime Transport] began to cut down on the storage areas of the port, placing on them the facilities for the ferry terminal. But experience has shown that with the putting into service of the first stage of the ferry crossing, the amount of freight being processed in the customary methods not only did not diminish, but increased significantly.

Today, not counting the freight carried by the ferries, the port is processing in a year almost five times more freight than was assumed in the design. Moreover, this quantity of freight continues to grow. The processing of this volume of freight falls on the twice reduced line of piers and on storage areas reduced by a factor of one and a half!

The port can cope with such volume only by increasing the intensity of cargo handling which, over the 10th Five-Year Plan, rose by a factor of 2.2. This potential has long been exhausted. In 1982 the Kholmsk piers are working under a large overload. The port storage area is not providing for the proper organization of the transshipment and storage of cargoes.

The designers of the second stage of the ferry crossing have learned these errors. Its technical and economic basis provides for the renovation of those piers on which cargoes are processed by the customary methods. It is contemplated that with the completion of these projects, three problems will be solved.

First, the southern barrier breakwater will be reliably reinforced so that the necessity for its annual repair, on which substantial funds already have been expended, will disappear and the same breakwater will be fitted as a pier for processing lumber, coal, and mineral construction material cargoes.

Second, the port will get additional storage area (about 4 ha) and this will allow a significant increase in the quantity of freight processed.

Third, the seventh and eighth piers will be set free for use in the processing of general cargoes.



9136
CSO: 1829/301

# 'POBEDA', FIRST TANKER OF NEW SERIES

Moscow MORSKOY FLOT in Russian No 7, Jul 82 pp 36-40

[Article by V. Pustovit, director of a group for the supervision of ship construction of the Ministry of the Maritime Fleet: " The Tanker 'POBEDA'" under the heading: "A new addition to the fleet". Color photographs in source are not reproduced.]

[Text] "Pobeda", the first tanker of a series has been completed at the Kerch shipyard Zaliv imeni B. Ye. Butoma. The ship is for the simultaneous transport of up to 4 grades of petroleum and petroleum products.

"Pobeda" is a single screw, single deck, diesel ship having a six-level superstructure in the stern, a forecastle, a bulbous bow, and a cruiser stern cut, above the waterline, into the transom type of stern.

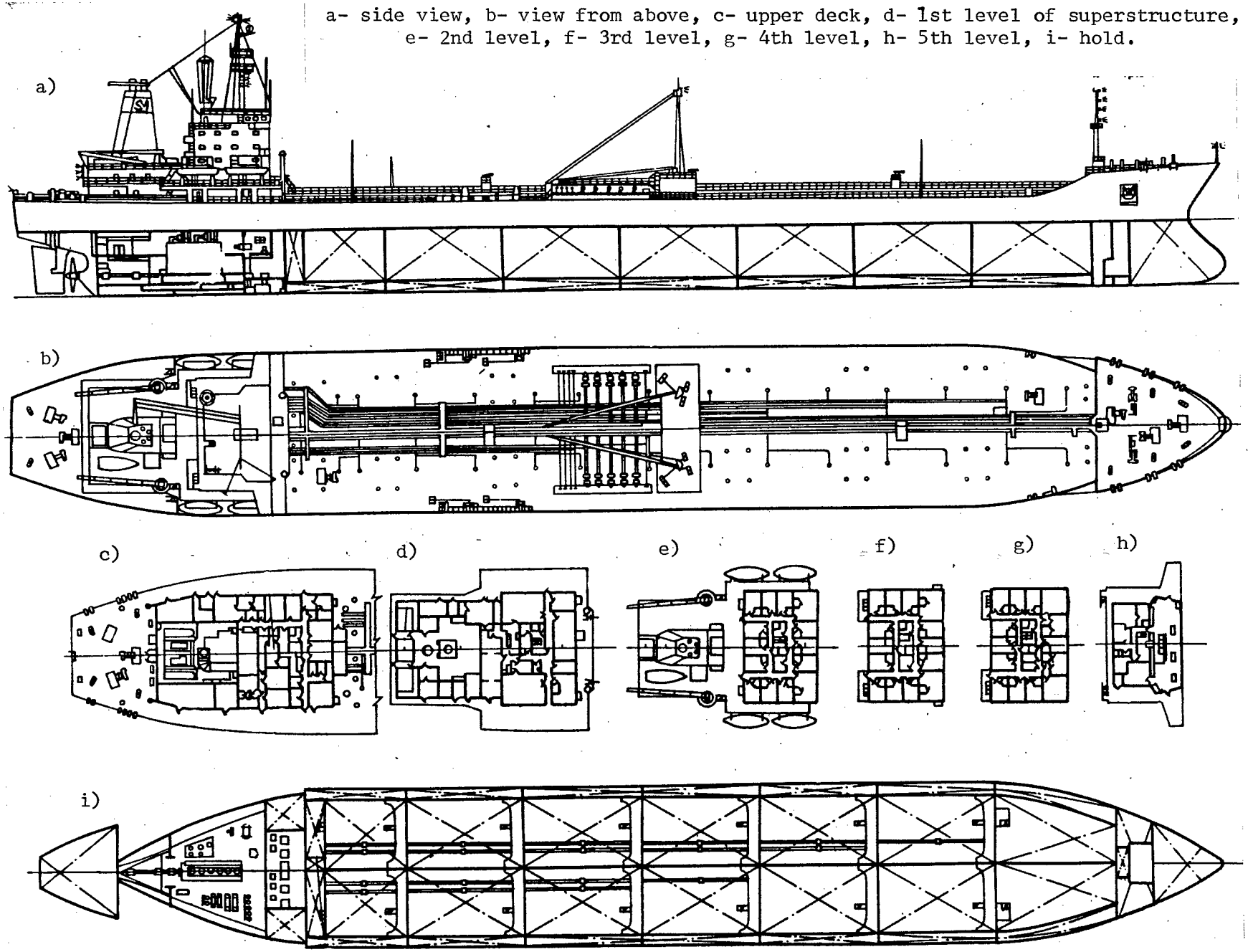
**Principal** Characteristics

| | |
|---|---|
| Length overall | 242.6 m |
| Length between perpendiculars | 228.0 m |
| Beam | 32.2 m |
| Height of side amidships | 18.0 m |
| Draft with full load and stores | 12.5 m |
| Full load displacement with 50% stores | 75,000 t |
| Deadweight at specification draft | 60,500 t |
| Cargo capacity including settling tanks | 71,100 $m^3$ |
| Number of cargo tanks | 16 |
| Navigation endurance based on ship's stores: | |
| on dry provisions | 60 days |
| on fresh water and other stores | 40 days |
| Speed | 15.8 kn |

In designing the ship, new engineering solutions were used. Construction was carried out by the progressive block-modular technology which provides improved construction quality and reduces construction time.

General Arrangement of Ship

a- side view, b- view from above, c- upper deck, d- 1st level of superstructure, e- 2nd level, f- 3rd level, g- 4th level, h- 5th level, i- hold.



The necessity to satisfy in full measure the requirements of the International Convention on the Prevention of Pollution from Ships (MARPOL-73) and the 1978 Protocol of IMCO [The Intergovernmental Maritime Consultative Organization] on the Safety of Tankers, required the adoption of a number of special features. Segregated ballast tanks were provided having a total capacity of 23,250 $m^3$ which amounts to 35.8% of the design deadweight. The segregated ballast is placed in compartments between the double sides and in the double bottom along the whole length of the cargo portion of the hull, and in the peak tanks. This provides maximum protection of the cargo tanks from collision damage and reduces oil spills in accidents to a minimum. It also provides for voyages in ballast without, as a rule, taking water ballast into cargo tanks. The ship has two settling tanks for two-stage settling during tank washing with sea water. The total capacity of these tanks is 1,592 $m^3$ which is 2.3% of cargo tank capacity. There is also a 140 $m^3$ tank for the collection of cargo residues formed during tank washing.

In addition, a 12.8 $m^3$ tank is provided for the discharge of residues from the cargo piplines. There is a piping system with international standard flanges for the delivery to shore of oil-contaminated water and another for the discharge, above the waterline for maximum draft in ballasted condition, of clean ballast and purified wash water from the settling tanks. An SOP system of the Salen-Vikander Company of Sweden provides automatic monitoring of the oil content of wash and bilge water being discharged overside and cuts off the discharge in case of an oil content above that allowable. An oil separating station of the coalescent type is provided for cleaning bilge water from the engine room and the forward pump room which is collected in 163 $m^3$ and 43 $m^3$ tanks. There is an LK-50 installation for the biochemical purification of sewage water with a 13.5 $m^3$ collecting tank (for 6 days). An OG-400 incinerator of the Norwegian company Golar-Metal burns liquid and solid wastes and garbage. An inert gas system increases safety from explosions, and a redundant control system for the steering engine increases the reliability of the steering gear.

Besides these, measures to satisfy the U. S. Coast Guard requirements for the prevention of pollution of the sea have been carried out on the ship.

The ship was built according to the Rules and under the supervision of the USSR Register of Shipping to the classification КМ ⊕ Л3 ⊕ А1 (tanker). The hull is made of carbon and low-alloy shipbuilding steels, has double sides, a double bottom, and a longitudinal bulkhead in the cargo tank area.

The unsinkability of the ship is assured with any one compartment flooded. A Luga cathodic system protects the underwater portion of the hull from corrosion. The ballast tanks have surface protection and painting of the overheads and upper parts of the sides down to 0.5 m from the upper deck.

The upper deck, the sides, and the bottom in the middle part of the length are longitudinally framed. The ends of the ship are transversly framed. The hull is divided into 11 watertight compartments. The longitudinal bulkhead in the cargo tank part of the hull is corrugated with wavy corrugations which lowers bulkhead weight and reduces the length of welded joints. The use of the corrugated bulkhead in combination with the smooth structure of the inner sides and

bottom (the framing of the tanktop and the inner sides is installed on the segregated ballast side of these surfaces), with the provision of limber holes of the necessary size in bilge knee brackets, and with suction wells in the tank bottoms, the amount of unwashed oil residues on the inner surfaces of the tanks is reduced to a minimum. The drinking water tanks are made of stainless steel.

As the basis for the architectural arrangement of the stern of the ship, the principle of maximum separation of living quarters from the engine room casing was stipulated. The living quarters are arranged above and toward the bow from the engine room in a six-level, straght-sided deck house having identical horizontal cross sections along the four levels other than the first and the upper level. The navigating stations are arranged in the deck house.

Living accomodations consist of two cabin units of increased comfortableness (study, bedroom, and bathroom with bath), five unit cabins (study, bedroom, and sanitary facilities), 29 single-berth cabins, and four double-berth cabins. The single-berth cabins are fully standardized, having identical dimensions, construction, and furniture arrangements. The wardroom mess and the crew's mess are on the first level adjacent to the galley. The provision lockers are situated below the galley on the upper deck and connected to it by a lift.

There are the following public compartments: smoking lounge, library, exercise room, shop, and an open swimming pool. The crew's mess can be used as a movie theater. A bath and laundry unit and an infirmary are situated on the upper deck.

During acceptance trials it was established that underway vibrations of the hull and machinery do not exceed the norms of the USSR Register. Low frequency vibration in the living, service and public compartments satisfies public health norms. On the whole, according to the airborne noise levels, acoustic conditions on the ship are favorable.

The cargo system is composed of four separate pipelines each with branches into a group of tanks for one grade of cargo. Each pipeline is served by its own turbine-driven centrifugal pump delivering 1,500 $m^3$/hr at a head of 120 m of water. The possibility of delivering every grade of cargo by any pump has been provided. The seamless steel extra-thick cargo system piping runs in the cargo tanks and on the upper deck. The control fittings are hydraulically driven rotatable gate valves with devices signalling their last position which are situated in the main pump room on the upper deck, and terminal gate valves in the tanks. In each tank there are two $D_u$ 250 [250 mm nominal diameter] suction branches to increase the reliability of the system as well as to make it possible to clean the tank using only one valve. The terminal branch pipes, beyond the gate valves, are led into suction wells in the bottoms of the tanks. Risers, cut directly into the main pipeline for their own group of tanks, run from the main line on deck. Bellows type expansion compensators are installed in the pipelines in the necessary places.

The cargo piping system provides for the closed reception of cargo by means of nonshipboard facilities at up to 10,000 $m^3$/hr. Reception and delivery of cargo is accomplished on both sides near amidships. Control of the principal fit-

tings of the cargo and stripping systems as well as the cargo and stripping pumps is done remotely from the control station for cargo operations (PUGO) situated in the first level of the superstructure with provisions for visual observation of the upper deck.

Each cargo pump is equipped with a Sentri-Strip system (furnished by the Swedish company IMW) which is composed of a vacuum attachment on the suction line of the pump and a throttling valve on the discharge line. The Sentri-Strip system automatically regulates pump discharge according to the changing conditions in the suction line by proportionate closing of the throttle valve on the discharge line of the pump. Thus, the complete stripping of residues from the tanks is done with the cargo pump alone and there is no necessity for a separate tank stripping system.

There is a system for cleaning the main receiving and discharging pipe lines. It is for stripping cargo residues from the cargo piping system into the collecting tank for cargo residues, for discharging cargo residues from the collecting tank into onshore or floating receiving tanks, for operating the tank washing system, and for stripping cargo tanks in case of a malfunction of the Sentri-Strip system. The cleaning system is served by two Stozer and Pitt, vertical, turbine driven pumps. The steam turbine is situated in the engine and boiler room. The transmission of torque to the cargo, cleaning, and ballast pumps is accomplished through special vertical shafts able to compensate for the angularity and misalignment caused by elastic deformations of the hull during changes in the loading of the ship. The pipes of the cleaning system are extra-thick seamless steel pipe fitted with bellows type expansion compensators in the required places. The fittings are hydraulically or hand operated rotatable gate valves situated in the main pump room.

The ballast piping system is for taking in, and discharging segregated ballast from the double bottom and the between-the-sides tanks. It is served by two electric ballast pumps each delivering 900 $m^3$/hr with a 10-meter head. The ten segregated ballast tanks in the double bottom and the spaces between the double sides have individual $D_u$ 250 pipelines with hydraulically driven, rotatable gate valves situated in the main pump room. Ballast tanks are filled both by gravity and by ballast pumps. Ballast is discharged from the tanks by the pumps in combination with ejectors. (The ballast water discharged by the pump is delivered as the working fluid for the ejector.) The suction of the ejector is connected to a main pipeline from another tank, thus simultaneously pumping out two tanks. Ballast water from the tanks is discharged above the waterline for the ballasted condition.

Monitoring of the cargo and ballasting operations is done in the station for the control of cargo operations where the necessary information is available on the following parameters:

- the level of the cargo in the cargo and settling tanks,
- the last positions of the hydraulically driven rotatable gate valves in the cargo, cleaning, and ballast piping systems,
- the suction and discharge pressures of the cargo and ballast pumps and ejectors,
- the liquid level in the segregated ballast tanks and the discharge tank,

- the monitoring of the gas composition in the cargo tanks,
- and the oil content of water being discharged overside after washing the cargo tanks.

The tank washing system is a fixed installation which includes:
- two turbine driven screw pumps for cleaning,
- two preheaters,
- a VEZh-250 ejector delivering 100 $m^3$/hr with a 120 m head for each of the two washing machines on each tank,
- the washing implements (portable washing machines, cleaning ejectors, pneumatic lifts, and so on,
- the settling tanks, and the necessary piping and fittings.

The system provides for washing raw petroleum from tanks by means of cold or hot water with the use of washing preparations.

The settling tanks are connected together by an overflow pipe forming a two-stage system for flow sedimentation. Tank washing access holes are provided in the upper deck for the finish washing of shaded zones. The number of such access holes was brought to a minimum thanks to the smoothness of the tank walls, bulkheads, and bottoms. Visual monitoring for the appearance of an oil film in ballast tanks is done through inspection plates installed in the ballast tank manhole covers.

Monitoring of the oil content of water being discharged overside during tank washing is done with the SOP system which also continuously measures oil content during the discharge overside of wash and bilge water. It controls the overside discharge valves in the pipelines, closing them upon reaching an instantaneous limiting value of oil concentration in the discharged water, or upon reaching the limiting intensity of discharged petroleum product per mile of travel depending on the ship's speed. The computer of the SOP system provides a taped print-out of the pertinent data about the discharge monitoring process. The overside discharge is done through openings on both sides of the ship which are above the waterline in ballasted condition.

To prevent the possibility of the ignition or explosion of cargo vapors, the ship is equipped with an inert gas system to create an atmosphere in the cargo tanks which has a minimum oxygen content. The exhaust gases of the auxiliary boilers are used as the inert gas. At a 40% loading these boilers produce exhaust gases with an oxygen content of no more than 5%. The system consists of a drip separator, a deck water seal, and two straight-through scrubbers which are connected in series to guarantee the required degree of cleaning and cooling of the gases. There also is an overside cooling-water pump delivering 250 $m^3$/hr at a 30 m head. There are two gas blowers (one of which is a stand by) delivering 10,300 $m^3$/hr at a pressure of 110 kPa and the necessary piping and fitting including automatically controlled hydraulically driven rotatable gate valves, nonreturn cut-off valves in deck trunk lines and other equipment. The inert gas system can be controlled automatically or remotely by the special system, Viktoria-M-02.

Analysis of the gas and air medium in the tanks to determine the oxygen and hydrocarbon contents is done with a Salviko equipment set made by the Salen-Vikander company and installed in the control station for cargo operations. To provide for the gas and air exchange, each tank is fitted with ventilating and blow-off ducts which are supplied by the high velocity gas delivery system. For the receipt of outside air during degassification of tanks, a mushroom shaped air intake head with a gate valve is installed on the suction line of the blowers. All of the equipment of the inert gas system is situated in a compartment on the upper deck except for: the cooling-water pump which is installed in the engine room, the Salviko system which is in the control station for cargo operations, and the deck water seals which are installed in the open part of the upper deck.

The ship has electrohydraulic mooring and anchoring gear consisting of:

- two (bow and stern) hydraulic pump stations,
- two anchoring-and-mooring winches providing and anchor chain take-up speed of 10 m/min, a pulling force on the mooring drum of 20 t and a mooring line take up speed under load of 16 m/min,
- six automatic mooring winches with a rated pulling force on the mooring and warping drum of 16 t and a take up speed under load of 16 m/min.

Anchor gear includes:

- two standing and one spare Hall anchors each weighing 11 tons,
- two cast anchor chains with an 82 mm cross-bar gauge of the third strength category (which gives an advantage in weight of about 13 t relative to chains of the second strength category
- two chain stoppers,
- and two devices for securing and releasing the bitter ends of the chain.

Remote dropping of the anchors from the pilot house is provided with automatic braking up to an adjustable speed setting in the range of 100 m/min and automatic stopping when the chain runs at 140 m/min. At the local station and on the navigating bridge there are indicators of the length of chain paid out.

Mooring gear includes:

- ten mooring bitts with 660 mm diameter rotating posts,
- four welded bitts with 450 mm diameter posts
- 16 six-roller chocks, and other equipment.

Nylon ropes are used for mooring lines and they are stowed on the winch drums. During winch operation in the automatic mode, a panel in the pilot house provides signals indicating the last four turns on the drum or a fully taken in line.

The R 21 M1 electrohydraulic steering engine which has two pump units, a rated turning moment of 200 ton meters, and an Aist automatic pilot, lays the semi-balanced streamlined rudder from one side to the other in 28 seconds. A stand-by pump unit is provided having a rated turning moment of 50 ton meters. There is a centralized station for feeding lubricant to the supporting and thrust absorbing rudder stock roller bearing.

The ship has four tanker-rated lifeboats each with a 36 person capacity, four inflatable life rafts each for 10 men, and a plastic work boat for passenger services.

The ship's main engine is a 7DKRN80/160-4 diesel with a continuous power of 12.36 MW (16,800 hp) at 122 rpm. The engine was manufactured at the Bryansk Machinebuilding plant under license from the Burmeister and Wain company. It is a reversible, two-cycle, crosshead type engine with gas turbine supercharging and a built-in thrust bearing. The maximum continuous power of 13.61 MW (18,500 hp) can be used unrestrictedly for a period of 1 to 2 days when necessary to make up for lost time and bring the ship back on schedule. The overload power of 14.86 MW (20,200 hp) can be used for a period of 1 hour followed by an interval of not less than 12 hours. The minimum stable rpm is 37, and the rpm for dead slow, because of torque variation conditions, is 77.

The engine is equipped with automatic systems providing for its operation without a watch for 24 hours. It is supplied with a system for remote control from the TsPU [the Central Control Station] and with the GROM system for remote automated control from the pilot house.

The system of emergency and precautionary signalling and protection for the engine provides for:

- precautionary and emergency signalling from 86 points about 31 parameters (pressure, temperature, flow),
- undisconnectable protection of the engine (by stopping it) for an rpm in excess of 138,
- remote shutdown protection (by stopping or reducing rpm) in response to eight parameters,
- and shutdown protection for a drop in lubricating oil pressure (by means of turning off pneumatically operated valves.

A centralized, automated monitoring system remotely measures 23 parameters at 52 points. The systems for automating the diesel during control from the pilot house provide for the following:

- programmed, slow, prestarting rotation of the engine by air,
- automatic starting including the carrying out of 3 attempts to start,
- a programmed set of rpms (normal, slow, and special),
- stepless changing of engine rpm during maneuvering,
- reducing the rpm or stopping the engine in response to a signal from the protective unit,
- programmed passage through zones of critical rpm,
- programmed cooling of the engine upon operator command before stopping,
- emergency stopping of the engine upon operator command,
- sustaining the temperature of water and lubricating oil and the viscosity of the fuel,
- and recording maneuvering processes by means of a recorder of reversings.

The main engine drives a bronze fixed-pitch propeller having a 6.5 m diameter and a 33 ton weight. The stern tube gear includes a poured babbit bearing working in lubricating oil, a licensed type 4SC shaft seal of the Chuetsu Vaukesha company, and other necessary equipment. The propeller shaft diameter is 660 mm.

The auxiliary power plant consists of:

- three 500 kW, DGR500/500 alternating current diesel generators,
- an 800 kW, TGU-800 alternating current waste heat turbogenerator,
- a 100 kW, DGFA100/1500R alternating current emergency diesel generator,
- two KV 2 automated auxiliary boilers producing 25 tons of steam per hr,
- and a 6.5 tons per hour, KUP 1100 waste heat boiler.

Installed on a ship for the first time is the new and promising assemblage, Zaliv-M, of general purpose systems for the control and monitoring of engineering facilities including the Izhora-M system for the remote, automated control and monitoring of the shipboard electrical plant. Izhora-M does the following:

- issues a signal for the automatic starting and switching in of a standby generator when the working generator reaches a 90% loading or upon the de-energizing of a bus of the main distribution panel (GRShch), or when there is a malfunction of the turbogenerator or a diesel generator,
- provides for accurate synchronization of the generators with the buses of the main distribution panel and for the distribution of the active loading,
- provides for the automatic unloading of generators by cutting off unimportant second order consumers,
- monitors the isolation of the main distribution panel buses,
- prevents the start up of powerful consumers when there is an absence of reserve capacity,
- signals an unloading of the generators down to 30% during parallel operation,
- provides for the remote starting and stopping of diesel generators,
- and monitors and sends signals about the parameters of the electrical power.

The Priboy-1 system for monitoring and controlling auxiliary machinery and local automatic systems serving the main engine is a part of the Zaliv-M complex. Priboy-1 continuously and automatically monitors the parameters of the main engine and the auxiliary machinery serving it. During an irregularity in the parameters, the system produces an interpretive signal on its own panel with mnemonic diagram, sends an external alarm signal, produces an indication on the Shipka-M centralized monitoring system, and signals the "address" of the engine room area involved. The system remotely and automatically controls individual and paired pumps, fans, compressors, filters, and separators.

The Naroch'-M system for controlling and monitoring general shipboard hull piping systems provides remote automatic control of the systems for draining and cleaning bilge water, the receipt and transfer of fuel, and the water fire fighting system. It also provides information on the operation or malfunction of the following localized systems:

- the airconditioning and refrigeration installations,
- the inert gas system,
- the high and low pressure compressed air systems,
- the sewage system
- the installations preventing pollution from discharged water,
- the installations for burning wastes, and the cathodic protection system.

The Il'men'-M system for controlling cargo operations on a tanker provides:

- remote control of rotatable gate valves and signalling their extreme positions with lights,
- light and sound signalling of the achievement of the upper liquid level in cargo, settling, and ballast tanks,
- remote control of ballast pumps and light signals about their operation,
- automatic closing of cargo tank gate valves upon receipt of the upper liquid level,
- remote automatic control of the pumping out of ballast and wash water in accordance with the monitoring of the petroleum content detection system,
- automatic stopping of the cargo pumps because of low tank pressure or because of a limiting oxygen content in the inert gases in accordance with the signals of the Viktoria system,
- and automatic control of the operation of the hydraulic pumps with remote signalling.

The Viktoria-M inert gas control system provides automatic or remote control of the equipment and fittings of the inert gas system for operating modes of "Loading and en route", "Unloading", and "Ventilating".

In addition, the Zaliv-M complex includes the Shipka-M system for the centralized, automated monitoring of shipboard engineering facilities, and the Tangens-1 centralized power supply system which produces electrical power of the required parameters for the whole complex of control systems.

For the comprehensive automation of the processes of piloting, navigation, and the solution of general shipboard operational problems, a Briz-1551/1 complex is installed which includes a Briz-I data and computer set, a Briz-N-1551/1 navigation set, Briz and Nayada radar sets, and other equipment.

The combined use of the automated systems for piloting and navigation and the means of automating the power plant permits safe navigation under any meteorological conditions without a watch serving the power plant.



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## 'MOSSOVET', LIQUIFIED-GAS CARRIER

Moscow MORSKOY FLOT in Russian No 7, Jul 82 p41

[Article by special correspondent V. Yuzhnyy: "The Gas Carrier 'Mossovet'"]

[Text] In June 1978 T. B. Guzhenko, minister of the maritime fleet, signed the order placing the new port of Yuzhnyy into operation. At that time, on the shores of the Adzhalysk estuary, the first stage of a plant near Odessa for the production, storage, and transshipment of liquified ammonia and superphosphoric acid already had begun operation. The tanker and gas carrier "Bulduri" of the Latvian shipping company which became the first to load liquified ammonia, opened the new port to shipping.

Participants in the construction of the production and port facilities greeted Comrade Leonid Il'ich Brezhnev, general secretary of CPSU Central Committee and chairman of the Presidium of the Supreme Soviet USSR. In his own greeting, he wrote: "I express strong confidence that in the future you will persistently strive for placing the second stage of the facilities into operation ahead of schedule and for the development of the designed capacity of the port and plant near Odessa."

The Odessans ardently responded to the appeal of Comrade Leonid Il'ich Brezhnev. The second stage of the plant was put into operation 3.5 months ahead of the planned date.

Now, Soviet and foreign gas carriers regularly sail from the port of Yuzhnyy with liquified ammonia on board. The motorship "Mossovet" leads the flotilla of Black Sea gas carriers. It was built at the Italian shipyard "Breda" in Venice. The newspaper VECHERNAYA MOSKVA on the 17th of September 1980 wrote: "The flagship of the new flotilla of powerful oceangoing ammonia carriers, the 'Mossovet', has set a course for the Atlantic." By radio, the ship's crew congratulated V. F. Promyslov, the chairman of the Moscow Soviet.

The first year of operation of the ship, which coincided with the final year of the 10th Five-Year Plan, was successful. The annual plan was fulfilled ahead of schedule on December 18th. The overall financial result of the ship's operation for the year amounted to +6,855,000 rubles. "Mossovet" sailors worked well in the first year of the 11th Five-Year Plan - all voyage assignments were fulfilled or over-fulfilled.

There is significantly greater physical and psychological stress on gas carrier sailors than on their colleagues on dry cargo ships or even on tankers carrying the usual petroleum cargoes. Gas carrier sailors constantly carry gas masks with them, and, if necessary on a voyage, they even go to independent breathing apparatuses. Besides all the basic anxieties of sailors, here they take part in a gas alarm drill every week.

Taking into account the specific conditions on gas carriers, sailors on them receive a 25% bonus on salary, an additional day off, 0.5 liter of milk daily, and an increased food ration. Captains of gas carriers are authorized to stop for milk in all ports of the world along the way. For every gas carrier, two crews are formed. Frequent changing of crews sharply improves the relaxation of the sailors.

V. Agapov, a captain of long range navigation, commands "Mossovet". In 1957 he completed the mariner's course at the OVIMU [Odessa Higher Marine Engineering School]. After school, Vladimir Mikhaylovich worked on various tankers of the Novorossiysk Shipping Company and became a captain. In 1972 he transferred to the Black Sea Shipping Company and commanded the bulk carrier "Azov". When the first gas carrier appeared, the Black Sea management proposed (in view of his large experience in tankers) that he lead its crew. Vladimir Mikhaylovich taught himself and then taught the others. On voyages, technical training is carried out twice a week. As a rule, the lessons are held at a work place or under conditions simulating an emergency. The captain is convinced that sailing on a gas carrier is completely safe if all the rules and instructions for the operation of the shipboard gear and machinery are accurately carried out. It simply is necessary to become accustomed to the routine of gas carrier life.

The position of gas engineer on the ship is very responsible. It should be said however, that it is not even mentioned in the Regulations of the service nor in the USSR Code for commercial navigation. Obviously this gap should be filled. Meanwhile, the positions of gas engineers are included with those of the former refrigeration engineers from fruit carriers and passenger ships. As a rule, they are all graduates of the Odessa Technological Institute of the Refrigeration Industry.

Three gas engineers work on "Mossovet" - V. Zhuravlev, I. Pavlenko, and S. Shumilov. They are all fine specialists. On one voyage they loaded the ship in the port of Yuzhnyy in a day and unloaded it (50,226 t) in the American port of Taft, Mississippi in 30 hours. There were no claims against the ship from the recipient of the gas. During the ocean crossing, the gas engineers assured the proper operation of the gas liquifying installations (there are three on the ship). The thing is, that liquified ammonia should have a constant 33.4 C temperature but the outside temperature changes, especially along the shores of Cuba and in the Gulf of Mexico.

The role of senior seaman on "Mossovet" is unusual. V. Gapich works in this position. He has been working in the Black Sea shipping company for 19 years. Viktor Nikolayevich not only does the carpenter's and storekeeper's work as provided by the Regulations, but also bears the responsibility for the safe-

keeping and condition of the individual means of protection for the seamen. He teaches them to use gas masks and breathing apparatus. The crew members say that one can confidently rely on Gapich in a difficult moment. What could be higher praise than this?

There are many good workers on "Mossovet". Among them are the electrical engineers V. Lukovtsev and A. Laposhin, the chief of the radio shack, V. Gudkov, seamen M. Ashuyko and I. Arbuzov, the substitute boatswain, Ye. Sysoyev, the cook T. Mandrus, and the snack bar attendant V. Ospishcheva. Senior engineers V. Kud' and A. Shpak, mechanics Yu. Rubanov, Ye. Kirilin and V. Shevchuk, motormen N. Bobrovnik and N. Nagornyy, machinist O. Shtabov, electrician N. Mikhalkevich, and others work selflessly.



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# LIGHTER CARRIER MAINTENANCE DISCUSSED

## New Approach

Moscow MORSKOY FLOT in Russian No 7, Jul 82 pp 46

[Articles by G. Byutner, chief engineer of the Black Sea Central Planning and Design Bureau and N. Khokhulya, chief engineer of the motorship "Yulius Fuchik".]

[Text] The Soviet Danube Shipping Company operates the lighter carriers "Yulius Fuchik" and "Tibor Samueli". These ships have a cargo transport system which is new in principal and which determines the features of the organization of shipboard work and engineering maintenance. The first difficult period of assimilating the ships, of organizing the work and engineering maintenance on them has already passed. The crews continue to search for ways to reduce the labor consumption in the operations. One of these ways is to use a means of diagnosis without disassembly in carrying out planned preventive inspections and repairs. N. Khokhulya's paper discusses this.

The paper of G. Byutner proposes a new approach to conducting maintenance of shipboard equipment.

The editorial staff of the magazine is turning to the sailors and onshore maritime organization enterprises with the suggestion that they discuss the problems of the planned preventive inspection and repair of the ships.

[Article by G. Byutner:"The Maintenance of Lighter Carriers"]

In accordance with the planning schedule for engineering maintenance (TO) on "Yulius Fuchik" class lighter carriers as worked out by the Black Sea TsPKB [Central Planning and Design Bureau] to sustain the serviceability and restore the running order of the shipboard structures and engineering facilities, it is necessary to carry out maintenance operations having a total annual volume of 92,000 man-hours per ship.

Of this, taking into account the labor needs for the operation and control of the ship, its power plant and cargo handling facilities, and other shipboard work, the ship's crew can absorb only 37,000 man-hours.

Thus, there is a deficit of 55,000 man-hours per year for the coverage of which a system of organizational and engineering measures is necessary. The fundamental basis of the system that has developed is the widespread enlistment for maintenance of the onshore repair enterprises of the Soviet Danube Shipping Company.

The principal component, the core of the maintenance system for the lighter carriers is the specially created maintenance base (BTO) situated near the anchorage for these ships to accomodate loading operations. The composition of the 45-50 production workers of the maintenance base must include shipfitters for the repair of various kinds of shipboard structures, welders, pipefitters, electricians, and specialists for the maintenance and adjustment of the electro-mechanical shipboard automation systems, and also, painters.

In addition to the maintenance base specialists, it is necessary to enlist the efforts of other Soviet Danube Shipping Company organizations without whose help it is impossible to carry out the large periodic labor consuming operations such as painting the above-water sides and the variable waterline area of the ship which is planned to be done twice a year. This work has to be done during one operational layover; that is, in 3-4 days. To include all the painters necessary for this in the personnel of the maintenance base is irrational because of the lack of work for them the rest of the time.

In addition, it will be necessary to enlist specialists for those kinds of equipment on which the amount of maintenance work cannot be accomplished by the steady employment of one worker (the radio and electronic navigation equipment, general refrigeration equipment, hoisting equipment, etc).

For all the specialists of the other organizations (besides the maintenance base people), the work on the ship is planned to be done during the times of operational layovers in the base port.

Planned for these same operational layovers is the maximum possible intensity of maintenance base work which is organized on a broad front as necessary to continue the productive operation of the ship. By such an arrangement, even with the maximum intensity of maintenance base work, it is possible, in the time of one year's operational layovers, to carry out less than 21,000 man-hours of maintenance work of the necessary 55,000 on each ship.

Another way of doing the maintenance is to assign maintenance base specialists to a ship to do work during voyages. Available lifesaving facilities and living accomodations on the ships does not permit sending a team of more than 7-8 persons on a voyage. And even with a practically constant presence of such teams on each lighter carrier, this arrangement cannot complete more than 22,000 man-hours of maintenance work annually.

It is therefore necessary to organize another, at present little used method of operation; namely, maintenance by the unit method in which an exchangeable stock made up of 180-200 identified shipboard engineering facilities is created along with shops for its repair and appropriate storage areas. In this an important part of maintenance base work during the operational layovers of the ships will be reduced to removal and reinstallation work, and the center of gravity of maintenance work will be shifted into onshore production locations when the ships are at sea. Such a form of the organization of maintenance work basically solves the problem of steady employment for maintenance base specialists.

An alternative to that solution is the introduction of longer working days for the crews of lighter carriers with the exchanging of crews after the manner of the "Geroy Shipki" class railroad ferries of the Black Sea Shipping Company.



## Modern Diagnostics in Engineering

Moscow MOSRKOY FLOT in Russian No 7, Jul 82 pp 47-48

[Article by N. Khokhulya: "Apply Modern Diagnostics to Engineering Facilities" Photographs in source article are not reproduced.]

[Text] The lighter carrier "Yulius Fuchik" went into operation at the end of 1978. Upon departure on the first operational voyage, the ship's company set about composing a planning schedule for engineering maintenance (TO). In October 1980, documents for the organization of engineering maintenance for ships of the "Yulius Fuchik" class, as developed by the Black Sea TsPKB [Central Planning and Design Bureau] were turned over to the ship. Incorporated in them were all the rules for engineering maintenance, labor protection, the USSR Register of Shipping documentation, the official regulations, orders, and decrees of the ministry, and so on. It turned out, however, to be impossible to use the planning schedule of the Black Sea TsPKB since it proposed that all the work be done by the method of disassembly and inspection.

With such an abundance of machinery (it is enough to say that on the ship there are four main and four auxiliary engines, two pusher tugs on which there are six diesels, about 40 hydraulic pumps, more than 100 hydraulic drives, and more), the total labor consumption for maintenance according to the Black Sea TsPKB's tally is 92,232 man-hours. According to the same TsPKB, the crew can produce 36,835 man-hours. The remainder must be done by onshore repair teams and the fleet maintenance base.

On the Vietnam line, a ship makes 8 voyages per year and the average layover in the base port is 6 days; whereas, the time for preventive maintenance requires a significantly longer layover. The situation is aggravated by the fact that with the improving management of lighter carrier transport, the layover time in Soviet ports tends to diminish. Obviously, it is necessary to seek other methods and procedures for maintenance. The basic method proposed by the Black Sea TsPKB is the disassembly and reassembly of machinery in order to detect and eliminate defects and in that way prevent equipment breakdowns. This method, however, has substantial deficiencies. First of all, it requires increased labor consumption. For a lighter carrier it is so large that it is impossible to carry out the TsPKB maintenance scheme without taking the ship

out of service. In addition, the methods themselves of carrying out the preventive maintenance, the technical provisions for the means of observing defects are not properly effective for the inspection of equipment.

The basic ways of detecting defects of parts are measurement of wear and visual inspection. While the measurement of wear is done with measuring instruments and of course is trustworthy, the visual inspection ("eyeballing") is very unreliable. There are no technical facilities on the ship for increasing the effectiveness of visual examination such as optical instruments, fiber-optic indoskopy [?] to see into spaces, and so on. We do not have the means for capillary defectoscopy - the inexpensive kits of liquids in aerosol containers which permit staining a part and revealing a crack on its surface. Shipboard specialists know how undesireable the supurfluous overhaul of machinery is.

The lighter carrier has Pielstik type RS2-5 U400 main engines. According to the proposed schedule, after 11,000 to 13,000 hours of operation the 64 pistons should be taken out for measurement and examination. According to the manufacturer's instructions, in any removal of a piston, cylinder liner stripping and replacement of all piston rings is necessary. After 11,600 hours of operation on the lighter carrier, two pistons were taken out for examination. For the whole operating time, cylinder liner wear amounted to 0.08 mm, and the clearance in the piston ring joints was 2.6-2.8 mm and in the kepy [grooves?] was 0.12-0.15, whereas the indexes of defectiveness are 3.5 and 0.35 mm respectively.

The manufacturer's instructions propose taking out the first two pistons after 6,000 hours, and then pulling out pistons by twos after each succeeding 3,000 hours up to 24,000 hours. According to their conditions the necessity to remove the remaining pistons is determined. On the lighter carrier the condition of the pistons and rings was such as to allow asserting that these parts still have a prolonged time for reliable operation. From what has been said, it is seen how large the labor and material expenditures are that we will incur with untimely overhaul of the main engines.

On the motorship "Yulius Fuchik", the cargo handling gear, the controllable pitch propeller, the bow thruster, the mooring and anchoring gear, and many other mechanisms have hydraulic drives. There are about 40 hydraulic pumps and more than 100 hydraulic drives on the ship. According to the proposed schedule at present it is necessary for all these devices to be overhauled to expose defects. The manufacturer's instructions for the IMO pumps of Swedish manufacture which are widely distributed on the ship, say that they usually do not require repair because, with proper use, the wear of the screws is very small. If a pump works satisfactorily and its output satisfies the actual demands, a stipulation of inspection once every four years is enough.

Thus, the basic way to inspect a pump is to check its output, not disassemble it. The Kone company requires that after each disassembly of hydraulic drives, they be flushed for 5 hours. A special stand is required for the flushing. At present on the lighter carrier it is impossible to overhaul all these mechanisms; therefore the main method of monitoring them is to check their operability. Up to now, the only question is the cleanliness of the mechanical equipment, but in some measure, the same can be said of the electrical, automation, and electronics equipment.

Planning schedules worked out by the Black Sea TsPKB for decades have given good service in the fleet. But in modern times, with the introduction of highly mechanized, specialized, and automated ships, these planning schedules for lighter carriers incur unjustifiably large expenditures for maintenance. Thus, during the guarantee repairs, the underwater part of the "Yulius Fuchik" was painted with a self polymerizing paint. The economic advisability of this measure is obvious but the cost of such painting is very high. The principal cost is for sandblasting the hull before painting. This coat of paint, after 2 years is being renewed without sandblasting, consequently it costs far less.

In October 1982 the ship must be presented to the USSR Register for its next examination. For this, drydocking and the completion of a large amount of work is necessary. Because of this, it would be better if the next examination was done a year later. The USSR Register's inspection can extend the classification of the ship, but without the cargo handling gear which, in October 1982, must be presented fully disassembled. And what does the disassembly of the cargo handling gear amount to? It means the removal and reinstallation of 5km of 42 mm diameter wire rope, the removal and disassembly of about 200 heavy pulley blocks and then their reassembly and reinstallation, the disassembly of eight powerful cargo winches and other equipment. Up to now the cargo equipment has had 1920 hours of working time. This is so small that it is worth thinking about whether it is necessary to subject all this equipment to full disassembly which will take the ship out of service for at least a month.

The widespread application of the means of engineering diagnostics - defectoscopy without disassembly - is necessary. New ships are complex and largely specialized, but there are no practical recommendations for the use of the modern methods of engineering diagnostics.



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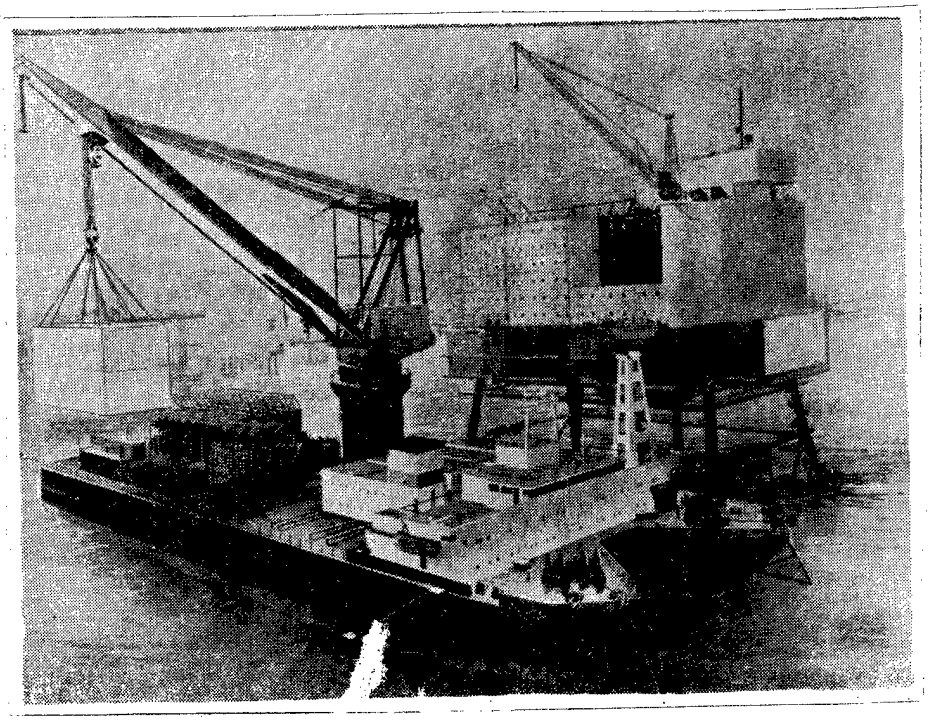
## FINNISH SHIPYARD TO CONSTRUCT FLOATING CRANES FOR COUNTRY

Moscow RECHNOY TRANSPORT in Russian No 5, May 82 pp 35-36

[Text] During the years 1983-1985 three catamaran-vessels--giant floating cranes with a 600-ton freight capacity--will be built on an order from the Soviet Union in the shipyards of the "Vyartsklya" (Finland) Joint Stock Society. They are designed for transferring large dimension equipment and for installation work at petroleum and gas deposits. Their design provides for the floating cranes to be able to operate under diverse climatic conditions with temperatures of from minus 30 degrees centigrade to plus 45 degrees centigrade. Their basic technical characteristics are: greatest length--141.4 meters; greatest width--54.5 meters; displacement--4 meters; boom span--40 meters; total capacity of main engines (electric diesel, three units)--5,550 kilowatts.





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OCEAN AND RIVER

IN THE ORBIT OF COOPERATION

Moscow VODNYY TRANSPORT in Russian 8 May 82 p 3

[Article by L. Mikhaylov: "In the Orbit of Cooperation"]

[Text] During the last five years the CEMA countries have carried out a number of measures to increase the capacities of ocean and river transport on a new technical basis with a broader specialization of equipment and an improvement of the technological processes of freight shipment. Joint shipping enterprises and lines have been created in the Baltic, Black Sea, and Danube; measures have been worked out for ocean shipments in the directions Baltic Sea-Cuba and Black Sea-Cuba.

"Interlikhter"

In December 1978 a lighter transport system began to operate between the river ports of the Danube and the ocean ports of India, Pakistan, Campuchia, the Socialist Republic of Vietnam, and Malaysia. Since this time more than 1.1 million tons of export and import cargoes have been shipped.

The introduction of lighters has expanded the capacities of the foreign trade organizations of the Danube states in their trade on the markets of the countries serviced by "Interlikhter." Since their operation began enterprises have dispatched 1,156 lighters from Danube ports in an export direction, and 34 round trips have been made on the Danube-India-Pakistan line and 14 on the Danube-Mekong line.

The system ensures the regularity of goods shipments on schedules and produces the greatest effect for freight holder countries which do not have access to the sea (Hungarian People's Republic, Czechoslovakian Socialist Republic, Austria). For example, since 1978 the Hungarian People's Republic and Czechoslovakian Socialist Republic have delivered 417,000 tons of foreign trade cargoes through Danube ports. The processing of such a quantity through the ocean ports of other states would require payment in currency, while transit shipments would require more than 29,000 railroad cars. Thus, the system has made it possible to decrease the freight delivery time by more than twofold.

In view of the effectiveness of this system the participant countries have planned a number of measures to develop the material and technical base, create their own repair base for the lighters on the Danube River, and expand the ocean areas which are serviced by the system.

Il'ichevsk-Varna

The creation of an ocean-going railroad ferry crossing between the Bulgarian port of Varna and the Soviet port of Il'ichevsk has made it possible to substantially reduce freight delivery time between the People's Republic of Bulgaria and the USSR.

Since the beginning of the crossing's operations direct rail freight shipments have decreased by 25 percent. The average round-trip time has decreased from 128 hours in 1978 to 57 in 1982, and processing time in the ports has been reduced threefold.

An important task is being successfully accomplished--the transfer to the ferry of freight from other types of transportation. A uniform technology has been developed for processing the ferry ships.

In the future it is planned to activate a complex of tasks connected with the automated recording and analysis of the ferry's operations, including technical, information, and organizational support for the ferry's operational plan, and the creation of an automated management system--"Parom." It is planned to solve the problems of raising the level of technical services for the ferry and of effective repairs for the ship mechanism and coastal objects by means of creating specialized joint technical servicing bases, and to bring the approach canal to the port of Varna to its planned dimensions.

"Dunaytrans"

The work of the Soviet-Bulgarian "Dunaytrans" Transportation Partnership is aimed at improving the use of the ships and other production capacities of the river fleet in the shipment of foreign trade cargoes on the Danube River. A monthly coordination schedule of joint traffic and tonnage processing in Soviet and Bulgarian ports is at the basis of the work.

Since the beginning of the operations of "Dunaydrans" around 2,500 joint echelons which have delivered 6 million tons of USSR and Bulgarian foreign trade cargoes have been dispatched from Soviet and Bulgarian river ports. Last year joint tug haulage reached 40 percent of the total caravans dispatched within the framework of the agreement. At the present time, the same traction and tonnage is shipping 20 percent more freight than in 1976. Overall non-productive idle time has decreased by 26 percent, and the need for tugboat tonnage has decreased also.

Making use of the experience of "Dunaytrans," ship owning organizations of the People's Republic of Bulgaria, the Socialist Republic of Romania, the USSR,

and the Czechoslovakian Socialist Republic and of the "Interlikhter" Shipping Enterprise have created a system of operations management which has been in effect since the beginning of the year in order to create the operations management of traffic and processing and make better use of the fleet's and ports' production capacities.

"Interport"

The economic association of the ports of the GDR and Polish People's Republic serves as an example of the development of cooperation in the Baltic. Since the beginning of the operations of "Interport" there has been an improvement in the coordination of work, in specialization, and in the use of the transfer capacity reserves of all of the Baltic ports from Vismar to Gdan'sk, and ship processing has been accelerated. Every year cooperation between these states deepens. In 1981 the freight turnover of "Interport" reached 860,000 tons, and this year it is planned to increase it to 1 million tons.

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## AUTOMATED MANAGEMENT OF PORT IN ESTUARY DESCRIBED

Moscow PRAVDA in Russian 19 March 1982 p 6

[Article by A. Kucherenko, PRAVDA correspondent: "Port in Estuary"]

[Text] "This is one of the biggest construction projects of the present and future five-year plans," says V. Taran, the chief engineer of the "Chernomor NIIproyekt" Institute. "It is already possible to imagine its appearance. Modern port construction presupposes specialization: of the fleet, and of the shore transshipment complexes. This will make it possible to mechanize and automate production operations.

A coal and ore processing area will be the first to go into operation on the shores of the estuary: two deep-water piers with a length of 650 meters, and ore and coal loading and unloading installations with a capacity of 5.5 million tons. Alongside there will be a production for the processing of sulphur and phosphorites designed for 2.5 million tons. The beginning of this construction is planned for next year. New complexes will be sited on the shores of the estuary: grain and container terminals, and sectors for processing the rolker fleet. It is planned to create a petroleum tanker area. It will be joined to the shore by a scaffold bridge. A ship repair plant and a dry dock will rise next to it. The port is being planned and built with a view toward the requirements of environmental protection.

When the construction is completed the port will have 60 piers capable of accepting ships with a freight capacity of more than 200,000 tons. Tele-control and transfer automations systems are planned. It is planned to create an industrial television system, and robot control through the use of an "Automated Management System-Port" system. . . ."

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